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Waste Management and Health Impacts in Rafah Secondary Schools, Gaza Strip, Palestine

إدارة النفايات والآثار الصحية في مدارس الثانوية في رفح، قطاع غزة، فلسطين

Iyad A. Afana

Supervised by

Prof. Mohammed R. Al-Agha
Faculty of Environmental Science

Prof. Yousef Aljeesh
Faculty of Public Health Medicine

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أنا الموقع أدناه مقدم الرسالة التي تحمل العنوان:

Waste Management and Health Impacts in Rafah Secondary Schools, Gaza Strip, Palestine

إدارة النفايات والآثار الصحية في مدارس الثانوية في رفح، قطاع غزة، فلسطين.

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نتيجة الحكم على أطروحة ماجستير

بناءً على موافقة شئون البحث العلمي والدراسات العليا بالجامعة الإسلامية بغزة على تشكيل لجنة الحكم على أطروحة الباحث/ **إياد عبدالكريم عطية عفانة** لنيل درجة الماجستير في **كلية *العلوم*** قسم **علوم بيئية – الصحة البيئية** وموضوعها:

إدارة النفايات وتأثيراتها الصحية في المدارس الثانوية في محافظة رفح- قطاع غزة- فلسطين

Waste Management and its Health Impacts in Rafah Secondary Schools, Gaza Strip, Palestine

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وبعد المداولة أوصت اللجنة بمنح الباحث درجة الماجستير في **كلية *العلوم*/ قسم علوم بيئية – الصحة البيئية.**

واللجنة إذ تمنحه هذه الدرجة فإنها توصيه بتقوى الله ولزوم طاعته وأن يسخر علمه في خدمة دينه ووطنه.

والله ولي التوفيق،،،

نائب الرئيس لشئون البحث العلمي والدراسات العليا

أ.د. عبدالرؤوف علي المناعمة

Abstract

Waste has been considered as a major environmental issue everywhere, besides the waste we create at home, school and other public places, there are also those from hospitals, industries, farms and other sources**.** This study aimed to assess school waste management and determining the environmental knowledge, attitude, and practice level among school student in the age group, 12 grades in governmental secondary school in Rafah city.

A descriptive, cross-sectional study was conducted on four governmental secondary schools. The sample consisted of 153 male and female students, were selected randomly. Three Tools where used to collect data; self-administered questionnaire for students, waste sorting and observational checklist, for waste management in selected schools. Data where analysed using the statistical package for social sciences software.

Additionally, most of students' parents income less than 1000 NIS, which represent 75.2%. Regarding fathers job and KAP, there is statistical significant P-value (0.010). Furthermore the finding show that students with excellent average have better mean score in all domains also there is statistical significant deference's (0.05) in KAP for student due to father educational level. Regarding Students' Knowledge Attitude Practice about environmental health hazard, the overall mean percentage for students' scores ranged from 69.8% to 82.8%. Attitude elicited a higher scores (85.9%) followed but knowledge (82.8%), and practice elicited a lowest scores (69.8%).

According to the waste sorting the result noted that the largest amount of waste was text books and papers (24.75%) among male students, while female students the largest waste was waste incineration (21.12%). In regard the observational checklist results show that the most school had a waste bins inside the classroom with 100%, and most schools had a clean furniture with average 40%.

The findings of this study may be useful in accentuate the importance of improving our students' environmental awareness and attitude to insure protecting our environment from further deterioration.

Keywords: waste management - waste Impact - solid waste - environmental health - environmental education - health education - secondary school - Gaza Strip.

المستخلص

تعتبر النفايات قضية بيئية رئيسية في كل مكان، اضف الى ذلك ان النفايات موجودة في البيت والمدرسة وغيرها من الأماكن العامة، وهناك أيضا مخلفات المستشفيات والصناعات والمزارع وغيرها من المصادر. تهدف هذه الدراسة إلى تقييم إدارة النفايات المدرسية وتحديد المعرفة البيئية والممارسة ومستوى المواقف بين طلاب المدارس الثانوية الحكومية في مدينة رفح.

وقد أجريت، دراسة وصفية مقطعية على أربع مدارس ثانوية حكومية، حيث تكونت عينة الدراسة من ١٥٣ طالبا وطالبة تم اختيارهم عشوائيا. ولقد تم استخدام ثلاثة أدوات لجمع البيانات وهى استبيان تدار ذاتيا للطلاب وفرز النفايات والمراقبة لإدارة النفايات في المدارس المختارة.

بالإضافة إلى ذلك معظم اباء الطلبة لديهم دخل أقل من ١٠٠٠ شيكل والتي تمثل ٧٥.٢٪، وفيما يتعلق بعمل الأب والمعرفة والممارسة والمواقف فلقد ظهر ان القيمة الإحصائية P كبيرة (٠.٠١٠)، وتظهر النتائج أن الطلاب الذين هم بمعدل ممتاز قد حازوا على دلالة إحصائية (٠.٠٥) في المعرفة والممارسة والمواقف بسبب المستوى التعليمي للاب. وفيما يتعلق بالمعارف والمواقف والممارسات حول المخاطر الصحية البيئية، فمتوسط النسبة المئوية الكلية للطلاب تراوحت من ٦٩.٨٪ إلى ٨٢.٨٪. واخذت المواقف أعلى الدرجات (٨٥.٩٪)، يليه المعرفة (٨٢.٨٪)، واخيرا الممارسة (٦٩.٨٪).

ووفقا لفرز النفايات أشارت النتائج إلى أن أكبر كمية من مخلفات الكتب والأوراق كانت بين الطلاب الذكور (٢٤.٧٥%)، بينما أكبر كمية من مخلفات حرق النفايات كانت بين الطالبات (٢١.١٢%).

كما تظهر النتائج أن معظم المدارس كان لها صناديق نفايات داخل الفصول الدراسية بنسبة ١٠٠٪، وان الأثاث نظيف بمتوسط ٤٠٪.

وأظهرت النتائج أن الخلفية الجيدة في المعرفة البيئية يمكن أن تؤدي في النهاية إلى تطوير موقف إيجابي تجاه البيئة، وبالتالي فمن المهم إثراء الخلفية البيئية لدى طلابنا في المعرفة والتوعية البيئية، وخاصة بالنسبة للطالبات اللواتي ليس لديهن الفرصة للتعرف على البيئة مقارنة مع الطلاب الذكور، وكما انه قد تكون نتائج هذه الدراسة مفيدة فإنه من الضروري التأكيد على أهمية تحسين الوعي البيئي لطلابنا وطالباتنا وان يكون هناك موقف لضمان حماية بيئتنا من مزيد من التدهور.

كلمات البحث: إدارة النفايات، تأثير النفايات، النفايات الصلبة، الصحة البيئية، التعليم البيئي، التثقيف الصحي، والمدارس الثانوية في قطاع غزة.

Dedication

To

My Parents, Wife, Uncles, Friends and Colleagues

With Love and Respect

Acknowledgment

First and foremost, I thank Allah for endowing me with health, patience, and knowledge to complete this study. Furthermore, I would like to express my special, sincere thanks and gratitude to my Supervisors Prof. Mohammed R. Al-Agha and Prof. Yousef Aljeesh, for their supervision, encouragement, guidance, and help through this study.

Special thanks to every-one who helped me to complete this study.

The Researcher

Iyad A. Afana

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List of Abbreviations

ANOVA	Analysis of Variance
EPA	Environmental Protection Agency
GDP	Gross Domestic Product
GS	Gaza Strip
ICI	Industrial, Commercial and Institutional
KAP	Knowledge, Attitude, and Practice
MEHE	Ministry of Education and High Education
MOH	Ministry of Health
MRFs	Materials Recovery Facilities
NGOs	Non-Governmental Organizations
OCHA	Office for the Coordination of Humanitarian Affairs
PA	Palestinian Authority
PCBS	Palestinian Central Bureau of Statistics
SPSS	Statistical Package for the Social Sciences
UN	United Nation
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Emergency Fund
UNRWA	United Nations Relief and Works Agency for Palestine Refugees in the Near East
US	United States
WB	West Bank
WFP	World Food Program
WHO	World Health Organization
OPT	Occupied Palestinian Territories

Chapter One

Introduction

Chapter One
Introduction

1.1 Research Background

Waste has been a major environmental issue everywhere since the industrial revolution, besides the waste we create at home; school and other public places, there are also those from hospitals, industries, farms and other sources (Abu Qdais, 2007). Waste define as any solid, semi-solid, liquid or contained gaseous materials discarded from industrial, commercial, mining, or agricultural operations and from community activities (Agamuthu, 2003).

Waste are items (individuals, offices, schools, industries, hospitals) don't need and discard, Sometimes there are things we have that the law requires us to discard because they can be harmful, Waste comes in infinite sizes, some can be as small as an old tooth-brush, or as large as the body of a school bus (Abu Qdais, 2007).

Waste management is the generation, prevention, characterization, monitoring, treatment, handling, reuse and residual disposition of solid wastes (Agamuthu, 2003). The management of hazardous waste is framed by the European Framework Directive on waste. This directive reaffirms in particular the principle of proximity, according to which waste must be treated as near as possible to its place of production (EPA, 2016).

Environment has become one of the hot topics for discussion these days among most sectors of society. In recent decades, many studies have reported the general deterioration of environmental conditions (Nunez, 2000). Escalating environmental degradation includes deforestation, desertification, loss of biodiversity, ozone depletion, global climate change, pollution and over consumption of natural resources which directly impact our ability to develop economically while at the same time sustaining the health of people as well as plants and animals (Kibert, 2000).

Along with exponential population growth, these problems are especially significant in developing countries (Vadala, 2004). For example, our Palestinian environment is facing serious threats, such as alarming population growth, limited land resources, long term isolation as a result of the regional political circumstance and the underdeveloped

environmental protection system which caused serious deterioration, fast depletion and contamination of our environmental resources that, in its turn, lead to health risk among citizens (UNEP, 2003).

As far back as the 1972 United Nations Conference of the environment held in Stockholm, environmental awareness has been a priority of the international community who recognized that economic security and development is directly tied to the health of environment (Kibert, 2000). In order to ensure that our common future will be ecologically, socially and economically sustainable, the commitment to raising public environmental awareness was renewed in 1992 at the Earth Summit in Rio de Janeiro and is manifested in chapter 36 of Agenda 21 (Sheila, 2004). Since this conference, the theme of environmental education has shifted from ecological studies to an integration of social, economic and environmental studies and the importance of lifestyle became some of the main tasks concerning environmental education (Sheila, 2004).

Everyone creates waste, although some people are very environmentally conscious and create very little, likewise, some countries do a very good job creating less waste and managing the rest, others are pretty horrible and have created huge environmental problems for the people and animals living there, all over the world communities handle their waste or trash differently, some common methods of managing their waste include land filling, recycling and composting, other communities strongly embark on waste reduction and litter prevention control aimed at reducing the production of waste in the first place, some communities also engage in waste to energy plants and hazardous waste disposal programs (Agamuthu, 2003).

Everyone must have the right to live and work in a clean environment, because of poverty, many people have no option but to live in slums, so public must working with some of the poorest communities to safely and securely improve their waste management and collection methods, this brings improvements to the health of the slum dwelling families and the creation of safer healthier places to live and work (Pugh et al, 1999).

Advances in the field of science and technology brought about industrial revolution in the 18th century and the information and communication revolution in the 20th century

has brought enormous changes in the way we organize our lives, our society, our economies, industries and institutions, these developments enhanced the quality of our live but led to manifold problems including the problem of massive amount of hazardous waste and other wastes generated from electric and electronic products (Kumar, 2001).

Naturally, a need for safety is an intrinsically human concern. Every individual in life whether one is employed or not, both at the workplace and outside the workplace has the intrinsic need tope safe. Workers, as mature individuals, are responsible for every decision they make with regard to securing their own health and safety in every social setting (Bonnet, 2002). Safety and health in the workplace have become an integral component to the viability of business for employers, labor unions, governments, and environmentalists in general (Zank, 1996).

Educating individuals about environmental issues should enable people to develop the knowledge, attitude and skills that increase the chance that they will be good environmental citizens (Vadala, 2004).

According to Abu Safieh (2006), environmental awareness and education are important means for preserving and protecting the environment, based on adjusting attitude and supporting positive behaviors toward the environment. She attributed that, the environment is a major source of living for Palestinians, and thus source of living to protect it becomes inevitable. Abu Safieh added that, nevertheless environment in the occupied Palestinian territory is vulnerable, taking into consideration the exposure to the occupation measures: confiscation of land, intensification of the unjust distribution of resources between Palestinian and Israelis, and as many reports indicate dumping the Palestinian areas with settlements' solid waste and liquid wastes. The pollution and rapid urbanization of Palestinians cities, mainly due to restriction on normal growth of Palestinian urban areas and lack of law enforcement in the Palestinian Jurisdictions, importantly justify the pressing need for environmental awareness within the Palestinian society.

1.2 Problem Statement

Based on demographic status of Gaza Strip (GS) were population growth is very high, the total population of Palestine at mid-2016 was about 4.81 million; 2.45 million males and 2.36 million females. The estimated population of West Bank was 2.93 million of which 1.49 million males and 1.44 million females. While the estimated population of Gaza Strip totaled 1.88 million of which 956 thousand males and 925 thousand females. The percentage of urban population at mid-2016 was 73.9%, while the percentages of population in rural and camps areas were 16.6% and 9.5% respectively (PCBS, 2017). GS has been a waste management problem particularly schools and its health impacts on students, and low level of knowledge, attitude, and practice (KAP) regarding environmental health hazard in schools. So; the study findings might help in determining the level of environmental knowledge, attitude, and practice among our school students among males and females, and conducting suitable solution to develop their (KAP) toward the environment.

1.3 Justifications of the Study

Negative health behaviors related to lack of knowledge about waste management, and environmental health hazard in schools that's lead to many diseases and environmental problems.

There is a lack of information in KAP about environmental health hazard among secondary schools students. Highlighting the importance of waste management for public health community, and the schools environment is need to mitigate health hazards. Standardizing the KAP among students and how to improve current attitude among them are of real importance.

This study will help to identify an appropriate recommendation to improve the environmental awareness among these students. This will eventually bring changes on the society way of thinking on the environmental issues; consequently, creating a more socially and ecologically sustainable society.

1.4 Significance of study

It's one of the important studies conducted in the GS, which aim to assess waste management in Governmental secondary school students in Rafah city and its relation with environmental health. Therefore, the study finding might help in determining the level of KAP among student and presenting proper solutions to reduce environmental health risks.

1.4 Aim of the Study

The aim of the study is to assess school wastes management, and determine the environmental KAP levels, and their relationships among school students in the age group 12 grades in the governmental secondary school in Rafah city.

1.5 Objectives of the Study

1. General objective

The general objective of this study is to assess waste management in Governmental secondary school students in Rafah city.

2. Specific objectives

1. To assess waste management in governmental secondary schools and identify the impact of school waste management on students health.

2. To identify the students' knowledge, attitude, and practice about environmental health hazard.

3. To examine the relationship between students' demographic and economics characteristic, and KAP among students.

1.6 Study Questions

1. What is the method used for waste management in Governmental secondary schools?
2. What are the students' knowledge, attitude, and practice about environmental health hazard?
3. Is there a relation between socio-demographic characteristics and knowledge , attitudes and practices among students?
4. What are the potential environmental health hazard impacts from the generation of waste associated with students?
5. How possible reference to the waste management model for stakeholders in the Ministry of Education and Higher Education?

1.7 Study Hypotheses

1- There is no significant statistical differences at (α=0.05) in the level of environmental knowledge, attitude and practice levels and their relationships among school students in the age group 12 grades in the governmental secondary school in Rafah city attributed to their gender.
2- There is a statistically no significant difference at ($\alpha \leq 0.05$) in the level of environmental knowledge, attitude and practice levels and their relationships among school students in the age group 12 grades in the governmental secondary school due to address.
3- There is a statistically significant difference at ($\alpha \leq 0.05$) in the level of environmental knowledge, attitude and practice levels and their relationships among school students in the age group 12 grades in the governmental secondary school due to their average.
4- There is no significant statistical differences at ($\alpha \leq 0.05$) in knowledge, attitudes and practices among students for environmental health hazard due to branch.
5- A statistically no significant relationship between the level of environmental knowledge, attitude and practice levels and their relationships among school students in the age group 12 grades in the governmental secondary school due to their branch.
6- There is a statistically no significant relationship between the level of environmental knowledge, attitude and practice levels and their relationships among school students in the age group 12 grades in the governmental secondary school due to health.

1.8 Value of the Study

Environmental health guideline included within secondary school curriculum as separate curricula in the year of 2001-2002, started from class 7 of high basic stage, then in the next year part two conducted on class 8, class 9 and class 10 of high basic stage, then first secondary grade. This curriculum has been conducted on male and females. Therefore, if the researcher in his study identifies significant differences in the level of environmental knowledge among our students based on gender, these results

may provide insight for the development and modification of the environmental education curriculum in the future.

1.9 General framework

The researcher will present his study about environmental KAP levels and their relationships among school students in the age group 12 grades in the governmental secondary school, in six chapters starting with **chapter one** which includes introduction about schools waste management and the importance of environmental KAP universally, and it's particularity and necessity in Palestine, problem statement, justification of implementing this study, study aim and objectives, study questions, and value of the study .

In chapter two, the researcher highlight the history of waste management universally, schools waste management, educational development, review the main studies emphasized the importance of environmental KAP, the efficacy of environmental education and awareness programs whether in the formal or informal ways, gender and its effect on the level of environmental KAP, and finally correlation between environmental knowledge, attitude and practices.

In chapter three, which concern with the conceptual frame work, the researcher will display the main part of this study which involves description of environmental education, and KAP.

Through chapter four, the researcher describe the main methodological, which include: Study design, study sample (study population, sample size, sampling process) study place, ethical consideration, study tools (description of both environmental KAP measurement tools), pilot study, data collection, processing and analyzing the data, and limitation of the study.

In chapter five, the researcher will present the main study results based on the results of the statistical analysis, which involves distribution of the study population according to the Rafah municipality distribution, the results of the study questions and hypotheses.

The study results will be discussed in chapter five, and then based on the study results, the researcher in **chapter six,** suggest conclusion, recommendations and further researches.

1.10 Operational definitions:

Solid waste: any garbage, refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material, resulting from industrial, commercial, mining, and agricultural operations and from community activities (Beychok, 2005).

Waste management: the collection, transport, recovery and disposal of waste, including the supervision of such operations and aftercare of disposal sites (Agamuthu, 2003).

Hazard: any source of potential damage, harm or adverse health effects on students (Schoenfeld, 1982).

Environmental hazard: is the state of events which has the potential to threaten the surrounding natural environment and adversely affect people's health. This term incorporates topics like pollution and natural disasters such as storms and earthquakes (Henschel et al., 1997).

Health hazard: a danger to health resulting from exposure to environmental pollutants, such as asbestos or ionizing radiation, or to a life-style choice, such as cigarette smoking or chemical abuse (Elsevier et al., 2009).

Health: its define as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 2006).

Knowledge: define as an information, understanding and skills that you gain though education or experience (Hornby, 2007)

Attitude: its define as evaluative statements that are either favorable or unfavorable concerning objects, people or events. They reflect how one feels about something (Robbins, 2001)

Practice: the researcher defines practice about what they do to prevent themselves from environmental health hazards (Huselid, 1995).

Landfill: environmentally acceptable disposal of waste on ground (Themelis, 2007).

Combustion: is a high-temperature exothermic chemical reaction between a fuel and an oxidant, usually atmospheric oxygen that produces oxidized, often gaseous products, in a mixture termed smoke (Magnussen, 1977).

Recycling: is a process to change waste materials into new products to prevent waste of potentially useful materials, reduce the consumption of fresh raw materials, reduce energy usage, reduce air pollution from incineration and water pollution (Cialdini, 1990).

Compost: is organic matter that has been decomposed and recycled as a fertilizer and soil amendment (Tuomela et al., 2000).

Grad 12: referred to as a high school , is a school which provides secondary education, between the ages of 17 and 18 , after preparatory school and before higher education (The Researcher).

Chapter Two

Literature Review

Chapter Two
Literature Review

2.1 Schools waste and Gaza Strip

Schools accumulate tons of waste from paper, computers, food and books. By learning how to properly handle this waste, school officials not only have an opportunity to greatly influence the future of their school, school district, and students, but they can also have a significant impact on the environment (EPA, 2016). Every day, school officials struggle to find time to get everything done.

To make waste reduction efforts and environmental protection feasible and practical for schools and school districts, the United State Environmental Protection Agency developed this easy-to-use guide to help schools and school districts implement new, or expand upon existing, waste reduction programs (EPA, 2016).

Based on demographic status of Gaza Strip (GS) were population growth is very high, the total population of Palestine at mid-2016 was about 4.81 million; 2.45 million males and 2.36 million females. The estimated population of West Bank was 2.93 million of which 1.49 million males and 1.44 million females. While the estimated population of Gaza Strip totaled 1.88 million of which 956 thousand males and 925 thousand females. The percentage of urban population at mid-2016 was 73.9%, while the percentages of population in rural and camps areas were 16.6% and 9.5% respectively (PCBS, 2017).

It has a very young demographic with rapidly growing youth segment, students under 18 years forming over half (estimated 52 %) of Gaza‘s inhabitants, infants and children under five years comprising 16 % of the population of particular concern to this initiative to protect children from adverse effect of poor hygiene, is the estimated 251,829 (16 per cent) Gaza infants and young children under five years, and are most vulnerable to the effects of inadequate sanitation and personal hygiene (UNICEF, 2011).

2.2 Economic status

According to the World Food Program (WFP), GS current economic situation is unsustainable, it depends on a consumption economy mainly and not a productive one. The new access rules brought mostly additional consumption goods, with probable access to a better quality and a wider range of products for consumers. However, it did not contribute to a more productive economy (WFP, 2011).

In the first half of 2011, the real Gross Domestic Product (GDP) in Gaza grew by 28% compared to the previous year. This growth reflects to a large extent, the increase in construction activities based on the smuggling of building materials through the tunnels, as well as the low base used for comparison (between 2006 - 2009, real GDP fell 30% cumulatively). The increased economic activity resulted in a significant decrease in the unemployment rate, which, by the second quarter of 2011, stood at 25.6%the lowest rate since the beginning of the second Intifada in September 2000. Youth unemployment remains very high and given the growing youth population, presents a worrying potential for instability (OCHA, 2012).

2.3 Environmental Health status in the Palestinian territory

To learn effectively, students need good health, Health is a key factor in school entry, as well as continued participation and attainment in school (Kishore, 2007). However, implementing a specific hygiene intervention to reduce illness is difficult since it is fundamentally impossible to isolate the effects of specific hygiene measures (Larson et al., 2002).

For students; schools are the sacred place which provided an environment for learning skills, and development of intelligence that can be utilized by students to achieve their goals in life (Huitt, 2011).

Over the past years, the Palestinian health care system had been developing in dynamic way to face the instability of the Palestinian situation (MOH, 2006). The four major providers of health care services in Palestine are: the MOH, UNRWA, Non-Governmental Organizations (NGOs), and the private sector. MOH is the main health

care provider; it provides primary, secondary services and purchased some secondary and tertiary services from private providers domestically and abroad (MOH, 2010).

The health system in GS is also fragmented with a large number of health providers, severe shortages of essential drugs and medical supplies, insecure power supply and lack of fuel for generators beside to inadequate maintenance capacity and spare parts for medical equipment, have contributed to decline the quality of care (WHO, 2012).

In the same context, the Oslo Accords managed to the establishment of the Palestinian Authority (PA) in 1994, which anticipated control of administration and services in many areas of Palestinian life, including education (Nicolai, 2007). Ministry of Education and High Education (MEHE) and the Ministry of Labor are the responsible bodies on vocational education and training institutes in Palestine (Fannoun, 2008).

The MEHE is the formal authority responsible for the education system and established instruments for planning, budgeting and management as well as for harmonizing education between the West Bank (WB) and Gaza (Ahmad et al., 2016).

School is free and obligatory in the opt until grade 10. With students entering the system at age six, basic education is then divided into the preparatory stage (grades one to four) and the empowerment stage (Grades five to 10). Secondary education includes grades 11 and 12, which can be academic or vocational. At the end of 12 years of schooling, students take the secondary school examination called the tawjihi (UNICEF, 2012).

Accordingly, measuring the level of KAP of schools students toward hygiene can be considered as the key indicator in evaluating the impact of health education programs and interventions on the personal hygiene among our school students in Gaza City.

2.4 Components of solid waste

The municipal solid waste industry has four components: recycling, composting, land filling, and waste to energy via incineration, and the primary steps are generation, collection, sorting and separation, transfer, and disposal, activities in which materials

are identified as no longer being of value and are either thrown out or gathered together for disposal (Aparcana & Hinostroza, 2015).

Major types of waste generated in schools are food waste, plastic, paper, floor sweeping, aluminum foils and theirs stationary items, pencil sharpening, and the tools to reduce waste in schools is reduce, reuse, recycle and buy recycled (EPA, 2016).

1- Collection:

The functional element of collection includes not only the gathering of solid waste and recyclable materials, but also the transport of these materials, after collection, to the location where the collection vehicle is emptied, this location may be a materials processing facility, a transfer station or a landfill disposal site (Al-Yousfi, 2004).

2- Waste handling and separation, storage and processing at the source:

Waste handling and separation involves activities associated with waste management until the waste is placed in storage containers for collection, handling also encompasses the movement of loaded containers to the point of collection, Separating different types of waste components is an important step in the handling and storage of solid waste at the source (Al-Agha, 2004).

3- Transfer and transport:

This element involves two main steps, first, the waste is transferred from a smaller collection vehicle to larger transport equipment, and the waste is then transported, usually over long distances, to a processing or disposal site (Bingh, 2004).

4- Disposal:

Today, the disposal of wastes by land filling or land spreading is the ultimate fate of all solid wastes, whether they are residential wastes collected and transported directly to a landfill site, residual materials from materials recovery facilities (MRFs), residue from the combustion of solid waste, compost, or other substances from various solid waste processing facilities, a modern sanitary landfill is not a dump; it is an engineered facility

used for disposing of solid wastes on land without creating nuisances or hazards to public health or safety, such as the breeding of insects and the contamination of ground water (Bingh, 2004).

2.5 Reduce Waste in Schools:

Major tools to reduce waste in schools (from schools to the landfill).

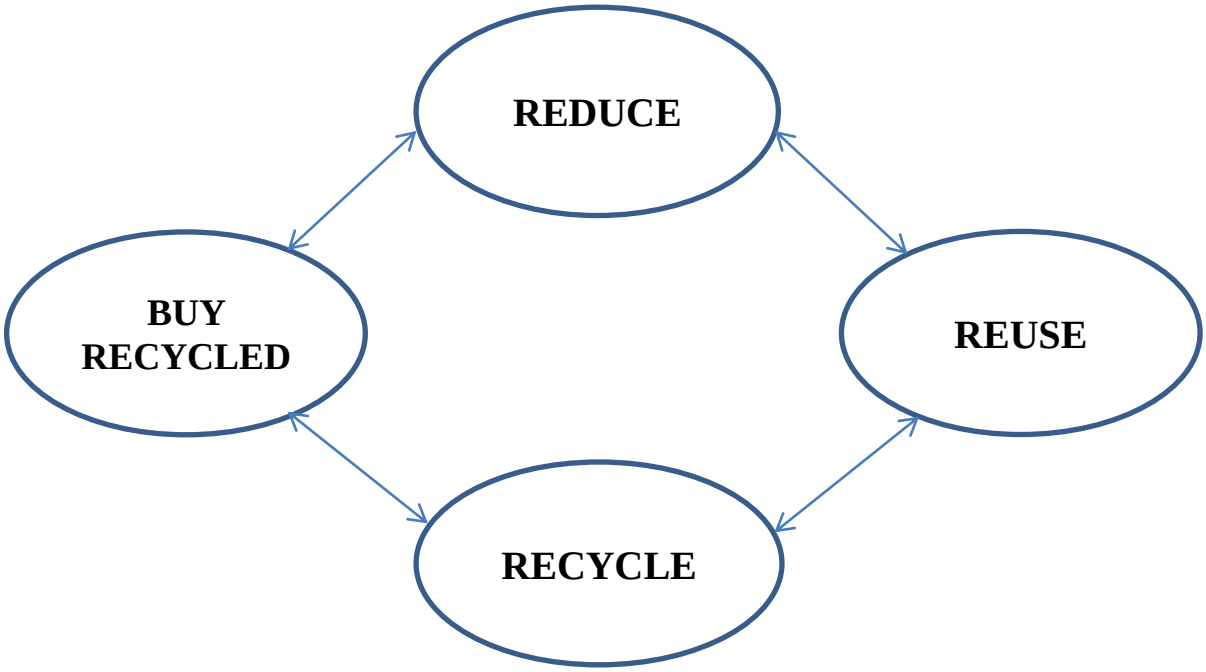

Figure (2.1): Tools to reduce waste in schools

Environmental Knowledge

It was suggested that young students should be equipped with a fundamental knowledge of basic environmental concepts and processes in order to make informed decisions on environmental questions in the future, and students are likely to have considerable knowledge about the science of environmental issues developed through `informal sources such as personal observations and the media (Gambro and Switzky, 2000).

However, when compared with other curriculum topics in science, this knowledge may be `rather rigid and full of erroneous interpretation and models. Therefore, the awareness of nature, underlying patterns and origins of such pre-existing ideas could be helpful in designing more effective teaching strategies (Boyes, 1996).

Various studies were conducted across different countries to measure the level of knowledge and awareness among students about environmental concepts and problems. In 1975, there was an attempt to describe what students know, think and feel regarding ecology and pollution (Braucht, 1975). A survey conducted by Fortner (1978), aimed to measure knowledge and attitudes of tenth grade students and related those attributes to the students' marine experiences. She used three types of survey covering 63 items to measure both knowledge and attitude. The 787 students who participated in this study demonstrated a knowledge level of fifty percent (50%). The results also indicated that their attitudes toward marine issues were moderately positive.

In his study students' knowledge and believes concerning environmental issues in four countries. Blum (1987) found that high school students possessed low levels of environmental knowledge.

He compared four surveys conducted in the United States, Australia, England, and Israel that assessed environmental knowledge and believes of 9th-grade and 10th-grade students. The surveys shared several items that assessed students' knowledge of environmental facts (e.g., sun as a major energy source in future) and concepts (e.g., living creatures are interdependent). Results indicated that the students' believes in environmental causes were generally stronger than their factual and conceptual knowledge.

This finding agree with several studies which reported generally low level of students' knowledge, such as study of Odah (1988), which was conducted on 630 males and females students from different years of study and colleges at Yarmook University in the kingdom of Jordan. The study aimed to examine the level of environmental knowledge among the students of the study population.

According to a study of over 1800 high school students in US, it is reported that "disappointing levels of knowledge" were found; only 36.3% of those students could answer five or more of the seven questions (Switzky, 1996). The study of Abu Jahjoh (1999), aimed to detect the environmental concepts values which preferred to be involved in science curricula of the elementary school in GS. Also in his study he measured the level of students' knowledge scores about the environmental values among the students' of grade nine in the elementary school.

Nasser and Nasser, (2000), evaluated the students' level of environmental awareness. This study was carried out in the Arab region which still under Israeli occupation since 1948. It aimed to compare between students of the elementary school and students of academic institution for preparing Arab teachers. The results of this study showed that the level of awareness about different environmental issues among students of the academic institution for preparing Arab teacher was higher than that among children of grade nine. According to the researchers' point of view and attribution, this result was expected due to age differences, number of studying years and learning about environmental awareness. In spite of this result the level of environmental awareness among both groups of the study population was very low, it was about 50% among students' of preparing teachers institution, while it was about 37% among students' of grade nine in the elementary school (Nasser and Nasser, 2000).

Affifi (2000) conducted a study to find out the environmental enlightenment level of sixth grade children in Rafah governorate and its relation with some variables.

The researcher has studied many factors, such as, type of school, governmental or UNRWA, gender, children's level achievement and place of residency. The study was conducted on 400 students'.

The study results showed that the average children's marks were (65.3%) which was below the accepted standard of the established study which is (80%). This result indicated that the level of the environmental enlightenment of the children below the accepted standard. There was a statistically significant difference between UNRWA and governmental schools toward UNRWA schools. While there was no statistical significance differences related to the place of residency (camp, town) throughout Rafah governorate on the environmental enlightenment level, a strong relation was found with academic level achievement of the students in favor to excellent achievers, where the excellent achiever students have more environmental enlightenment level than other students'.

Sheila, (2004), in her study investigated the environmental knowledge and attitudes of the third class students of the secondary school. The researcher constructed a three section questionnaire to measure students' environmental knowledge. The questionnaires were completed by 158 students of the third class from 4 secondary schools in Hong Kong.

The results indicated that these students' had low level of environmental knowledge, and their knowledge bases were not strong with the average knowledge score of 3.54 (Total: 8 marks). Similar finding was of Iran study, which reported that, the level of environmental knowledge of Yazd University of medical science in Iran was not appropriate Moghadam (2005). However, several other national and international wide environmental studies reported that the mean of environmental awareness and knowledge scores of the study population was higher than those reported in the above mentioned studies, such as, a study of Geok et al., (1998), whose purpose was to gather baseline data on the level of environmental knowledge of secondary and junior college students in Singapore. A sample of 1256 secondary from three classes of grade 9, and junior college one class of grade11 students were selected. The students' mean environmental knowledge score was 70.9%.

In their study, Roth (1996), aimed to measure the level of environmental knowledge according to the study different variables. Multiple choice questions tool was developed to measure the level of environmental knowledge.

Main results of the study emphasized that the level of environmental knowledge among the study population was 75.9%, and environmental attitude was 80%. Similar finding was In Hong Kong, which reported that, high levels of factual environmental knowledge are found amongst a sample of 1032 students (Chan, 1998).

Dadah (2002), in her study aimed at investigating the role played by the media in developing environmental awareness amongst university students in Ramallah and El-Bireh governorate. The study was conducted on a sample consisting of 745 students (331 from males and 414 from females). Two research methods were used in this study, Qualitative and Quantitative method. In qualitative method, number of newspaper articles about environmental issues from their major newspapers in Palestine (Al Quads, Al Ayam, and Al Hayatt Al Jadidah) were both consulted and analyzed. Also, environmental programs presented by the Palestinian broadcasting corporation and Palestine television station were analyzed. The quantitative method conducted by using a study instrument, which was a survey measuring environmental awareness among university students in Ramallah and Al- Bireh, and the role of the media in developing that awareness. The results revealed that the environmental awareness of the students appears to fall into the moderate range based on the survey result. The researcher mentioned that there were no statistically significant differences in the environmental awareness among students based on sex, high school specialization or residential location, while there were statistically significant differences among educational institutions, particularly Ramallah Men's Teaching College.

2.6 Environmental Attitude

Young people's environmental attitudes are particularly important because young people ultimately will be affected by and will need to provide solutions to environmental problems arising from present-day actions. To effectively confront the growing environmental problems and make informed decisions about them, the citizenry must be equipped with a fundamental knowledge of the problems that face the environment (Switzky, 1999).

In Hong Kong study, Chan (1998) found that the respondents showed overwhelmingly positive environmental attitudes with the mean scores of 992 secondary school students in Hong Kong ranged from 2.69 to 4.13 on a five-point scale.

Nasser and Nasser,(2000) emphasized a high level of environmental attitude toward environment among the students of the elementary school and students of academic institution for preparing Arab teachers, and there was not any significant difference between them in spite of age differences and number of years of education.

Sheila, (2004) in her study reported a generally high positive environmental attitude among Hong Kong secondary third class students. This was consistent with the findings of a survey of 447 students from 9 secondary schools in Hong Kong (Stimpson, 2002).
A study of Geok et al. (1998) in Singapore, reported that, the mean environmental attitude and behavior scores were 66%, which are considered as low level. This finding was consistent with local study of Nashwan (1997) which aimed at estimating the level of positive attitude of the elementary school students in GS toward their environment. The study population was 1590 male and female students selected from 3 levels of the elementary stage (7, 8, 9 grade of the preparatory stage) from different schools distributed along GS. The main results of this study showed that above 50% only of the study population have got positive attitude toward environment. Salmi and Mekhlafy (2003) in Oman Sultanate emphasized similar results.

After reviewing several studies it seems that there is a significant relationship between gender and environmental attitude. Most of them indicated that females were more likely than males to be environmentally concerned and/or willing to undertake behavior for the environment. As reported by Chan 1998, gender was significant in relation to environmental concern level favoring females among the secondary school students in Hong Kong.

Chonnell et al., (1998) found a consistent difference between males and females across several parameters were found which including views more consistently aligned with an-environmental paradigm, and belief in the possibility of having both a prosperous economy and a healthy environment. This was supported by similar findings reported by two other Australian studies (Clarke, 1996). Also, Salmi and Mekhlafy (2003) in

Oman Sultanate study, revealed significant differences in the level of environmental attitude among the study population favoring females.

2.7 Environmental Education and Practices:

During the 1960s and 1970s, environmental issues received more national attention, and environmental education seemed to have a very promising future as laws and programs began to be created in support of the subject area (Hengar, 2005).

During the 1970, the first international workshop on environmental education in Carson City, Nevada, , developed the first definition of environmental education, and set out to address concerns about its implementation, and its implications in regards to environmental conservation (Flynn, 2002). As early as the 1972 United Nations Conference of the Environment held in Stockholm, environmental awareness has been a priority of the international community who recognized that economic security and development is directly tied to the health of the environment (Kibert, 2000).

As a result of directives from the Stockholm Conference, from which the declaration of the United Nations Conference of the Human Environment was created, the Intergovernmental Conference on Environmental Education was held in Tbilisi, Georgia in 1977 where the Tbilisi Declaration was adopted. The critical objectives of the Tbilisi Declaration included heightening people's environmental awareness, sensitivity, attitude and concern for the environment, skills and motivation to act for environmental improvement and protection, and participation in solving environmental problems (Knapp, 2000). As environmental education developed over the years, a need for specific guidelines explaining what individuals should know and be capable of doing after their education was growing.

Ten years later, in September 2002, in order to assess progress made in this direction on a worldwide basis, the UN organized the World Summit on Sustainable Development in Johannesburg, South Africa (Hengar, 2005).

2.8 Importance of Environmental Education

The issues of development, environment and health are closely entwined. This reflects the complex links between the social, economic, ecological and political factors that determine standards of living and other aspects of social well-being that influence human health. A healthy population and safe environments are important pre-conditions for a sustainable future.

However, at the beginning of the 21st century, the education of many children and young people around the world is compromised by conditions and behavior's that undermine the physical and emotional well-being that makes learning possible. As a result, education policy-makers and teachers must embrace health promotion activities to achieve their goals. Schools must be not only center's for academic learning, but also supportive venues for the provision of essential health education and services, Adapted from improving learning outcomes by improving health and nutrition; Incorporating the FRESH approach in national action plans for achieving education for all (UNESCO and UNEP, 1990).

This module provides an overview of the holistic nature of health and the New Public Health movement. It also provides examples of the ways in which health can be taught as a cross-curricular theme through a focus on health education as a process of achieving the goals of healthy people, healthy communities and healthy natural environments.

According to Agenda 21, scientific literacy is one of the most relevant goals in schools in many nations. This literacy is an urgent need to improve the education system. Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues (Nunez, 2000). Through scientific literacy in the education environmental field, people can interact more effectively in the enhancement of a new and more harmonic relationship with our habitat.

Environmental literacy is a recent interdisciplinary curricular goal in our schools, and according to (Nunez, 2000), it is the organized way to think about the environment.

Cultural, gender, economic and other kinds of social and cultural differences are reported to be related to grade of awareness and amount of environmental concern (Arcury, 1990).

The lack of knowledge of the public and students in ecological topics has motivated many educators and institutions to improve environmental literacy (Nunez, 2000). Scientists are convinced that more knowledge is an important element to develop positive attitude in many fields (Arcury, 1990). This idea is treated in many studies, which indicated that the role played by environmental education to the individual, societies and peoples' lives is increasingly recognized. This is a result of man's misbehavior towards the environment (UNEP, 2003).

Different conferences have emphasized that protecting the environment is a complicated problem that cannot be ensured through laws only. Laws alone cannot change or develop the individuals' awareness, consciousness, attitudes and actions. Appropriate education inside and outside the school can play a major role in changing environmental attitudes and promoting awareness and skills for the protection of the environment and the rational use of natural resources (UNEP, 2003).

Environmental education aids in creating deeper understanding, investigation, and decision-making skills among students. The goal of environmental education is to lead students to become effective environmental stewards. Also, the goal of environmental education is to develop a population that is aware of, and concerned about, the environment and its associated problems, and that has the KAP, motivation and commitment to work individually and collectively toward solutions of current problems and the prevention of future ones (Flannery et al., 2003).

In his study focuses on the importance of environmental education which can play a significant role as an effective means to change people awareness and behavior for their surrounding environment. He also indicated that the environmental pollution caused many people to injure their health, so environmental education is needed to increase awareness of people about their important sharing in protecting and improving their environment (Mikami, 1999).

In 2002, Swartz indicated that the last few years have seen a dramatic increase in awareness of the simple fact that student may be harmed by a wide range of environmental toxicants, often in ways quite dissimilar to adults. According to this he suggested that there is much more needs to be done in educating the public, changing behavior, amending policies, and gaining more information to meet the challenge of providing a healthy environment and protecting student from environmental risk.

Since, the environment is a major source of living for Palestinians, thus practicing how to protect it becomes inevitable (Abu Safieh, 2006). In her study, Abu Safieh focused on the importance of environmental awareness, and education in preserving and protecting the environment, based on adjusting attitudes and supporting positive behaviors toward the environment. According to many key informants, environment in the Palestinian society, as a concept, is integrated within reticulation of social, health, and economic perceptions that embrace different aspects of life, and hence, environmental awareness and education for environment protection need to be approached through such channels (Abu Safieh, 2006).

2.9 The Efficacy of Environmental Education Program

Many studies have investigated learning outcomes that result from environmental education programs. Environmental education aims to extend students' knowledge about the environment, challenge the attitudes and behaviors that form the basis of environmental citizenship and develop skills to enable them to take action for the environment (Ballantyne et al, 2005). However, reviews of environmental education research (Leeming, et al, 1993; Rickinson, 2001) indicated that a considerable number of studies have only examined changes in learners' knowledge and attitudes after conducting environmental education programs whether it's formal education or non-formal education.

While other studies, have examined learners' knowledge and attitudes, and the relationships among cognitive, affective and behavioral variables (Rickinson, 2001).

Experimental research conducted by Bryant and Hungerford (1977), evaluated a kindergarten unit which focused on understanding the term "environment" and

associated pollution problems and their remediation. The researchers analyzed the effects of two classes of kindergarten. Bryant simultaneously taught two classes a one week introductory unit on basic environmental concepts. For three weeks thereafter, the experimental group received activity-oriented instruction on pollution and solid waste.

The conventional curriculum taught to the control group did not involve environmental issues. The treatment was then reversed. Each child participated in an interview consisting of four knowledge and opinion questions asked before and after the treatment. The researcher reported significant change; the results indicated that kindergarten children can form concepts concerning environmental issues and citizenship responsibility with respect to those issues.

Not only were these children able to identify actions which they themselves could take, but also many of the children were able to identify actions which adults could take. According to the above mentioned results the researchers suggested that, environmental education at the kindergarten level can result in some fairly sophisticated conceptual behavior on the part of the children involved.

Smith et al., (1997) in their study assessed the effectiveness of a short duration recycling education program that attempted to link specific environmental knowledge and attitudes towards paper recycling with the paper recycling behavior of grade school children. The researchers carried out a Pretest-posttest design measuring the effects of two versions of a paper recycling education program on knowledge, attitudes and behaviors of third, fourth, fifth, and sixth graders from private and public schools. Results indicate that the program improved students' knowledge, attitude, and behavior toward paper recycling, with greater improvements occurring in private schools and with older grade school children.

2.10 The Efficacy of Informal Environmental Education Programs

The goal of many outdoor or informal environmental education programs is to promote environmental sustainability (Ballantyne et al., 2005). According to this goal, many researchers developed a measurement tool that addresses the effect of these programs on

the level of students' environmental knowledge, attitude and behavior (Disinger 1985; Samaan 1988; Gayford 1996; Mohsen 2000).

Case's study,(1979) cited in Disinger (1985), was carried to determine the effect of an integrated eight-week environmental education curriculum integrated into the regular school curriculum revealed opposite findings. However, in his study, sixth-grade students of a Seventh Day Adventist school were randomly selected and assigned to three groups. Group A was treated with an integrated curriculum for five weeks, one week of a resident field experience, and an additional two weeks of integrated classroom curriculum.

Group B was treated with only the integrated curriculum for eight weeks; Group C acted as a control, receiving no environmental curriculum activities. A test was constructed to measure environmental knowledge. Statistically significant differences in the knowledge test favoring the B group were found in comparisons with Groups A and C.

Samaan, (1988) carried out a study which measured the effect of environmental summer camps on improving students awareness about their environmental importance, and problems solution. A group of 144 students of the secondary schools and university were chose from 4 summer camps in El Jeezah governorate to be examined in this study. The results emphasized partial improvement in the level of student's environmental awareness, and the researcher attributed these results to the short period of these camps to improve students' awareness about different environmental issues. All of the four camps did not reach the accepted level or success in improving students' awareness about population problem, and the fourth camps only attained increasing in students' awareness about male nutrition.

A study of Gayford (1996) involved an alternative approach to environmental education with students of 11 to 18 years. The focus of the work was outside the timetabled curriculum using the school buildings and grounds as a model for environmentally responsible management and behavior. Emphasis was on adopting criteria which were thought to lead to long-term attitudinal and behavioral change and also those which cast the researcher in a different role and gave a greater sense of "ownership" and control to the participants. According to this findings, the researcher suggested that this approach

has a good deal to offer in a context where it is becoming increasingly difficult to influence the timetabled curriculum yet where teachers and students feel that the environment is of great importance.

The goal of Mohsen (2000), in her study was to suggest a program in environmental education for adults and measuring its reliability in Palestine. The validity of the program has been measured through the application of Israeli violation unit on the Palestinian environment which was the first unit of the program suggested. The results emphasized success of the experimental study in developing the adults' acquirements and achieving the goal of the study, and that was clear in the presence of statistical significance difference between pretest and post test results in favor to post test. According to the above mentioned results, the researcher recommended to develop environmental programs for adults to increase their level of environmental awareness and their attitude toward environment.

Chapter Three

Conceptual Framework

Chapter Three
Conceptual Framework

Managing waste can be challenging for industrial, commercial and institutional (ICI) sectors. Organizations must deal with a wide variety of materials, large volumes of waste, and behaviors of many students. There is no one action that will best fit the needs of all schools. However, a strategic solid waste resource management planning approach will help to define solid solutions. Integrated waste resource management planning enables organizations to create a comprehensive strategy that can remain flexible in light of changing economic, social, material (products and packaging) and environmental conditions. Waste management is largely regulated by legislation and policy implemented at the municipal level.

3.1 Waste Characterization Studies

Information and education can shift behavior and help garner public support for waste management initiatives and can also help to build expertise. There are a wide range of activities which may take place to further educational efforts. Waste characterization studies and waste audits are critical to the process of designing and implementing a waste management plan and to gain insight as to where diversion efforts should be focused (Haymes et al., 2014). The results of waste characterization studies and waste audits can play a central role in educational campaigns that are used to foster support and motivation for waste diversion initiatives. The results of ongoing studies are also useful for evaluating progress towards achieving goals and objectives of a waste management plan, and also in helping to review previously established targets.

3.2 Environmental Education

Many people may think that environmental education is the teaching of knowledge about the environment. Others may think that it should be learnt through outdoor activities, like field trips (Sheila, 2004). In the late 1969, the word "environmental education" was first defined as it aimed at producing a citizenry knowledgeable concerning the biophysical environment and its associated problem, aware of how to help solve the problem, and motivated to work toward their solution (Henegar,2005).

3.3 Sources of Environmental Knowledge

After reviewing several studies, there are different sources of students' knowledge awareness, such as school, media, family and environmental clubs.

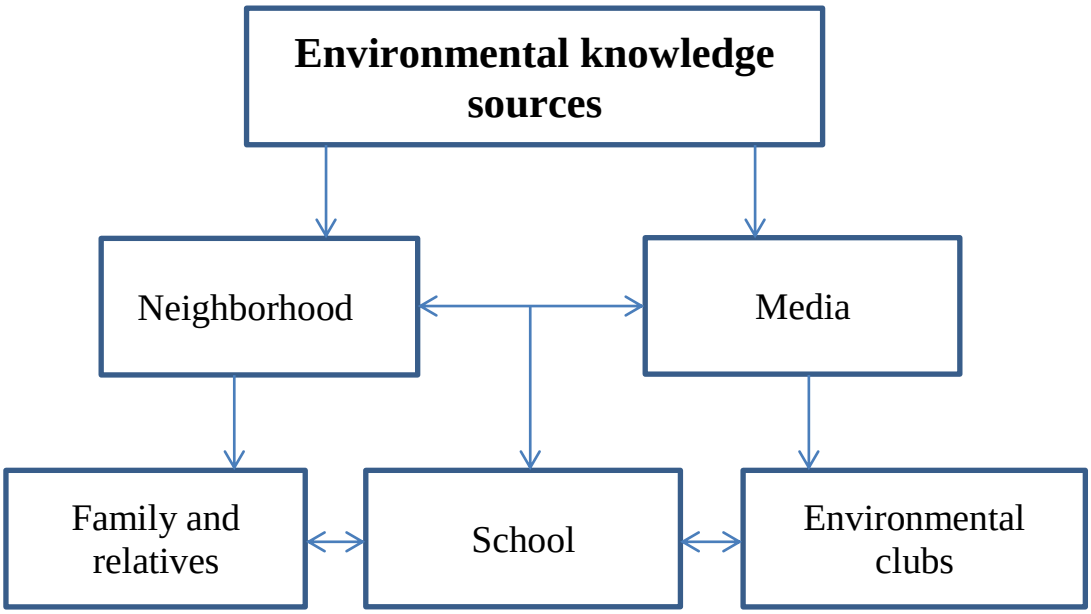

Figure (3.1): Different sources of environmental knowledge.

3.4 Theoretical Framework

From the evidence of literature reviewed, environmental awareness and attitude may be influenced by environmental knowledge. Moreover, all these may be also influenced by gender, place of residency, and grade of students' scores at school as hypothesized in the study.

Reviewing the different previous literature, the researcher has designed the theoretical framework in the following figure.

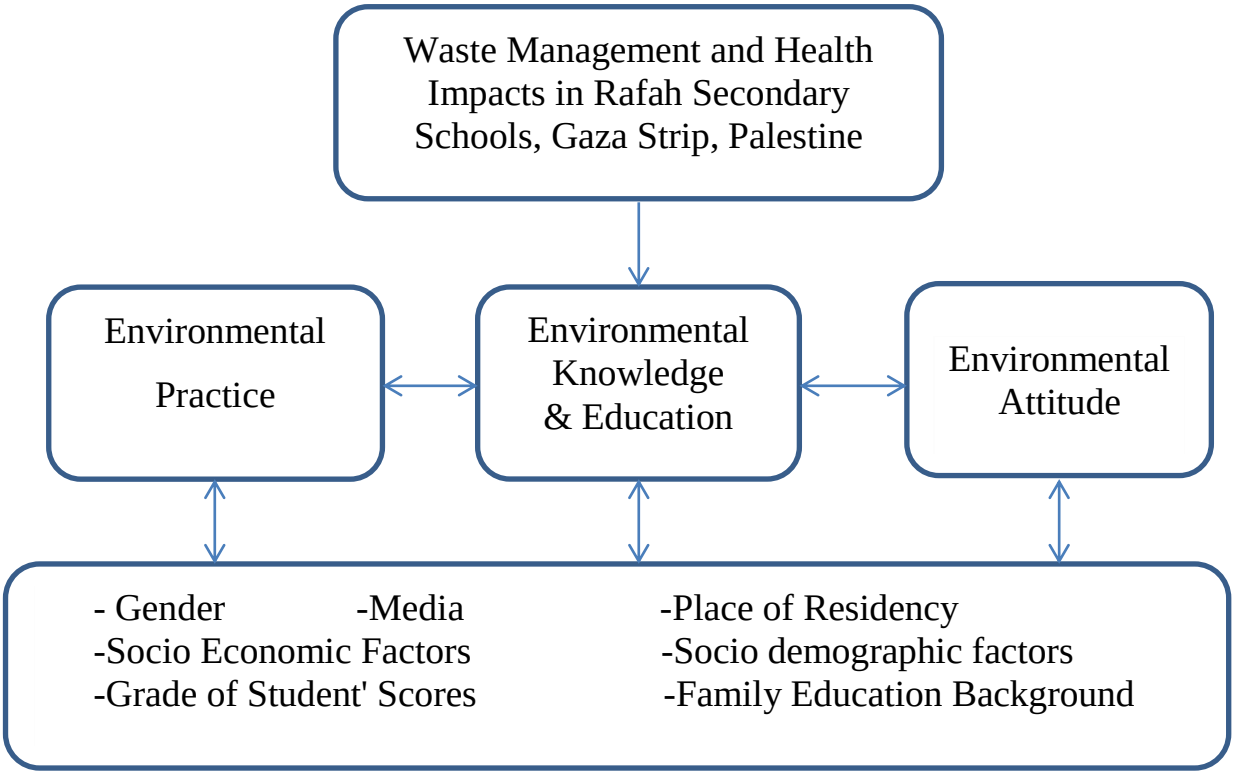

Figure (3.2): The relationship between environmental KAP of students, with different socio demographic factors such as: gender, place of residency, grade of students' scores, media, family background and socio economic factors.

Chapter Four

Methodology

Chapter Four
Methodology

4.1 Study design

Descriptive, cross-sectional study was conducted to assess waste management and describe the level of KAP of environmental health hazard among Governmental secondary schools students in Rafah city.

The dependent variables include environmental KAP; where the independent variables include socio demographic factors including Gender, Age, Branch, Student average at last year's, Students' health status, Father and Mother educational level, Father and Mother job, Family income, sex of students' place of residency, grade of students' score achievement at schools.

4.2 Study Sample and population

The population included all school students' in the age group 12 grades in the governmental secondary school in Rafah city.

Based on the MEHE Annual Educational Statistics (2016), we have 15 secondary schools , and each school contains a number of classes, the number of classes ranging from 3 classes and 17 classes, depending on the geographic location of the school and the large area.

4.2.1 Sampling Process:

Using the method of drawing lots and Cluster sampling, has been divided Rafah city to four areas, were selected randomly from each school district, then was selected one class from each school, wherever the target sample was 153 students.

According to Rafah municipality, Rafah city is divided into four areas, popular area (Midle of Rafah), agricultural area (Eastern Region), residential area (Tal-alsultan) and recent area (Aljonina) (Annex 1).

In this study, used cluster simple random sampling, the count the number of secondary schools in Rafah city (15) schools, then we counted the number of high school classes in all schools in each school and then we counted the number of students' each semester, and found that the total number of public high school students in all Rafah city schools equal to 3955 students.

Using cluster sample divided town of Rafah into four basic areas are as follows:

1- Tal-alsultan (Resident Area).
2- Middle of Rafah (Popular Area).
3- Aljonina (Recent Area).
4- Eastern Region (Agricultural Area).

4.3 Study Place

Using a simple random sample (lottery) has been selected one school from each region follow/

1- Eastern region (Al-Shoka Secondary School Girls).
2- Al-Juneina (Shafa-Amer Secondary School Girls).
3- Country "popular" area (Beer El-saba Secondary Boys School).
4- Tal-alsultan area (Mariam-farahat Secondary School Girls).

Using a simple random sample from each school chose one class as follows:

1- In Shafa-Amer Secondary School Girls, were chose class room No. (5), the number of student (38), and the total number of secondary school students (412).
2- In Beer El-Sabah Secondary Boys School, were chose class room No. (4), the number of student (41), and the total number of secondary school students (699).
3- In Mariam-farahat Secondary girls School, were chose class room No. (6), the number of student (40), and the total number of secondary school students (399).
4- In Al-Shoka secondary girls School, were chose class room No. (2), the number of student (34), and the total number of secondary school students (79).

Using cluster sampling probability cluster: chosen three class room of each school.

Using the method of lottery and put the number of class rooms in a box and choose a piece of paper, and the check was required people as a follow:

1- In Shafa-Amer Secondary School Girls, Selected class room No. (5), and the number of students signed (38) students.
2- In Beer El-Sabah Secondary Boys School, selected class room No. (4) and the number of students to 41 students.
3- In Mariam-farahat Secondary girls School, selected class room No. (6) and the number of students to 40 students.
4- In Al-Shoka secondary girls School, selected class room No. (2) and the number of students 34 student.

From the previous conclude that the total number of targeted students is 153 students.

Table (4.1): Sample distribution according to Rafah city areas, name of school and student gender:

Name Of School	Area	Student Gender	Sample Size	Percent
Shafa-Amer	Recent Area	Female	38	24.83
Beer El-Sabah	Popular Area	Male	41	26.79
Mariam-Farahat	Resident Area	Female	40	26.14
Al-Shoka	Agricultural Area	Female	34	22.22
			153	100

4.4 Ethical Considerations and Procedures

All necessary approvals have been obtained from the Islamic University of Gaza. Dean of research affair (annex 1), and approval from the MEHE (annex 2), The participants were given a full explanation about the purpose of the study, and an approval from the study participant were considered.

4.5 Study Tools

Three tools where used to collect data; self-administered questionnaire for students, waste sorting and four observational checklist for waste management in selected schools.

4.5.1 Self-Administered Questionnaire:

A questionnaire in English was translated to Arabic designed to accomplish the objective of this research to investigate the students' environmental knowledge, attitudes, and practice in respect to their relationship with gender, area of residence, student health, income, grade of student scores achievement at school variables. This design of the questionnaire was based on previously reviewed researches about environmental waste management in schools and how to measure the level of environmental knowledge, attitudes, and practice, textbooks and environmental waste management curriculum conducted school students in the age group 12 grades in the governmental secondary schools in Rafah city. A reference table was designed to guide the researcher to design the questions of the questionnaire.

The researcher concentrated on the variety of questions included in the questionnaire about different environmental issues included in the environmental waste management and KAP in schools curriculum . This means that the students in the age group 12 grades in the governmental secondary school who participated in this study have been exposed to these issues during these classes of the secondary schools. The questionnaire consists of 32 questions divided into three sections as explained below. Many environmental experts checked it to insure its validity (Annex 4).

4.5.2 Waste Sorting

The researcher has been go to Rafah municipality, for a private meeting with mayor of Rafah and municipal health inspector, then locking for municipal school waste management, and how to deal with it, have make field visits for targeted schools, accompanied by the health inspector, also meet health needs in targeted school and teach them how to deal with school wastes, then giving lectures to students in those

schools about the environment and how to keep them and how to dispose of the waste safe manner.

Four observational checklist for waste management in selected schools

In regard the observational checklist result show that most school had a waste bins inside the classroom with 100%, and had clean furniture with average 40%.

4.6 Data Collection

Data collection was accomplished through using a questionnaire of four measurement tools, the first tool for environmental Knowledge, Attitudes, and Practice measurement questionnaire, and the second tool for environmental waste management measurement by researcher checklist, third tool for interview with of environmental health ,fourth tool for waste sorting. The first part is related to personal information, name of student, name of school, gender, and grade of student scores achievement at school. This information was used in the study to examine the relationship between environmental KAP as dependent variables with gender, place of residency and score achievement at school as independent variables. The second part informs the students about the instructions for completing the questionnaire. They were told that all the data obtained will be used for research purposes and they were asked to answer the questionnaire as honestly as possible.

According to the pilot test, the survey took 25 minutes. Data collection process took two weeks duration and started from the first of January 2015**.**

Study and assess waste management in Governmental secondary school students and questionnaire will be self-generated.

The questionnaire will be self-generated and adapted from the literature.

It will be self-administered questionnaire, and questions divided into four sections:

Section A of the questionnaire covered questions on demographics of respondents

Section B of the questionnaire contained questions to evaluate schools waste management.

Section C of the questionnaire contained questions on knowledge, attitudes and practices of the respondents.

Section D of the questionnaire contained questions to evaluate attitudes of respondents.

4.7 Data analysis plan

Upon completion of data collection, data will be coded, captured on Excel and then imported into the statistical Package for Social Sciences (SPSS) version 17.0 for analysis.

4.8 Reliability and validity

4.8.1 Piloting to ensure validity

Piloting of the questionnaire will be done on thirty students volunteer final year students from the Governmental Secondary Schools.

4.8.2 Psychometric properties of the questionnaire:

In order to validate the instrument, validity and reliability tests were performed correlation coefficients between the realize construct were examined.

4.8.3 Validity:

Validity is defined as "the degree to which an instrument measures what is supposed to measure" (Haynes et al., 1995). Validity is a very complex idea that is important to the researcher and to those who read and consider using the findings in their practice. Validity testing validates the use of an instruments for a specific group or purpose rather than being directed toward the instrument itself. An instrument may be vary in one

situation but not valid in another. Therefore, validity must be re-examined in each study situation (Hemingway and Smith, 1999).

The researcher ensured the following different types of validity.

4.8.4 Face validity

Face validity refers to whether the instrument looks as though it is measuring the appropriate construct (Polit, Beck & Hungler, 2001).

Face validity is simply a demonstration that items of a test are drown from the domain being measured; it does not guarantee that the test actually measure phenomena in the domain. Face validity is a superficial conclusion about the match between a tests appearance and its intended use by asking a panel of experts to judge whether the test appears to be based on appropriate content. It is not sufficient evidence of content representativeness (Oremann, 1998).

4.8.5 Content Validity

Content validity is concerned with adequacy of coverage of the content area being measured. Content validity is a subjective estimate of measurement based on judgment rather than statistical analysis (Clark and Watson, 1995).

Content validity determines whether the items sampled for inclusion adequately represent the domain of content addressed by the instrument. The assessment of content validity spans the development and testing phases of instrumentation and supersedes formal reliability testing. Content validity is typically done by a panel of experts, which may include professional experts of the target population (Fitzpatrick & Wallace, 2006).

The researcher prepared a list of main environmental concepts covered in the environmental KAP curriculum conducted on students in the age group 12 grades in the governmental secondary school. According to this list and after reviewing many studies related to the subject, the researcher designed the study questionnaire to measure the level of environmental KAP among the students in the age group 12 grades in the governmental secondary school.

4.8.6 Construct Validity

Validating an instrument in terms of construct validity is a challenging task. Construct validation can be approached in several ways, but it always logical analysis and tests predicted by theoretical consideration (Clark and Waston, 1995).

Construct validity has become the central of validity assessment. It is now thought that construct validity really subsumes all other forms. In essence, construct validation is a creative process that rarely achieves completion. Instead, each piece of evidence adds to or detracts from the support of construct validity, which builds with time and use. Three major aspects of construct validity: (a) specification the domain of observables; (b) extent which the observables tend to measure the same concept, which provides a bridge between internal consistency, reliability, and validity; and (c) evidence of theoretically proposed relationships between the measure and predicted patterns (Wallace, 2006).

4.8.7 Double data capture to ensure reliability

Upon completion of data collection, data were coded and entered into the statistical Package for social science version (17.0) for analysis. The data was entered twice and analysis of the data was done twice, this was done to compare the findings to exclude any differences, the findings were identical.

Chapter Five
Results and Discussion

Chapter Five
Results and Discussion

5.1 Descriptive analysis of the sample

5.1.1 Background characteristics

The descriptive analysis has been taken to analyze the depth of the variables taken as independent variables. Total of 153 students have been selected from Rafah secondary school to complete the questionnaire, establishes the number and percentage of participants regarding socioeconomic and demographic profile variables. Of the 153 eligible students', (73.19%) were females, and (26.79%) were males. The age of the students' who are surveyed has been categorized into two groups according to Figure (5.1). The finding shows that 50.3% of the students' are fallen into 17 years old whereas 49.7 % of the students' are fallen into 18 years old.

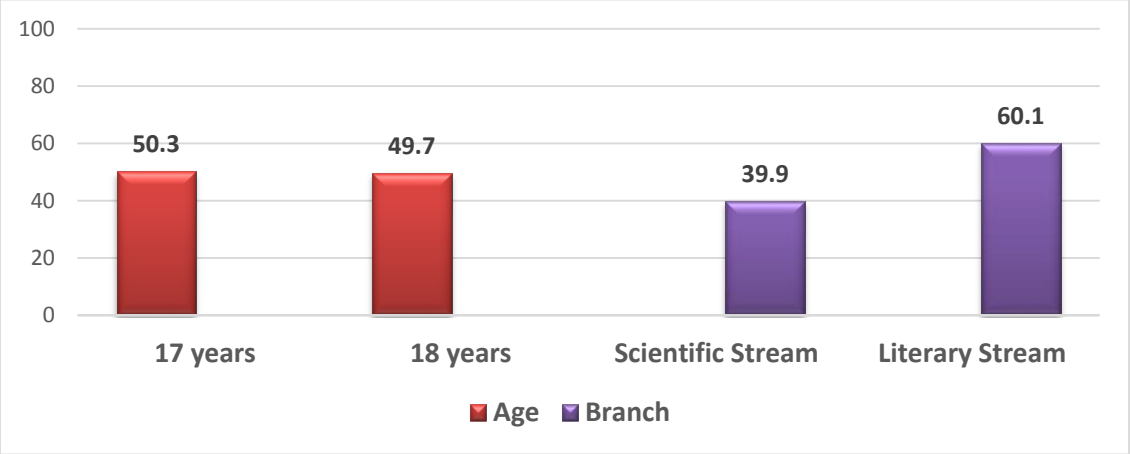

Figure (5.1): Percentage distribution of age group and branch of Rafah secondary school.

5.2 Types of schools waste

Make field visits to target schools and sort of schools waste, and a compilation of bags of each type of waste separately, then weighting each type of waste by sensitive balance and recorded, after that put them in one container.

The results as follows/

Table (5.1) : Beer El-Sabah school waste (male students):

No.	School Waste type	Weight by gm.	%	Rank
1-	Paper	8000	24.75	1
2-	Waste incineration	6500	٢٠.١١	2
3-	Steel cans	6000	١٨.٥٦	3
4-	Tree leaves	2200	٦.٨٠	4
5-	Plastic bags	2000	٦.١٩	5
6-	Chips bags	1800	٥.٥٧	6
7-	Organic waste	1700	٥.٢٥	7
8-	Plastic bottles	1200	3.72	8
9-	Plastic cup	1100	3.40	9
10-	Cartons	800	٢.٤٨	10
11-	Chalk	600	1.85	11
12-	Smooth paper	160	٠.٤٩	12
13-	Pencil	140	٠.٤٣	13
14-	Pen	90	٠.٢٨	14
15-	Smoke cans	30	0.092	15
	Total	32320	100 %	

Table (5.1) showed that textbooks and notebooks paper is the largest amount of waste (24.75%), followed by waste incineration (20.11%), then soft drinks steel cans (18.56%). This evidence of use of a lot paper and burn in the waste containers in Beer El-Sabah school, and this reflects the students nature who lives in the camps and social nature that he inherited in the disposal waste from special books paper.

Table (5.2) : Mariam-farahat school waste (female students):

No.	School Waste type	Weight by gm.	%	Rank
1-	Paper	4000	١٧.٤٢	1
2-	Chips bags	3200	١٣.٩٤	2
3-	Steel cans	3000	١٣.٠٦	3
4-	Smooth paper	2300	١٠.٠١	4
5-	Carton bottles	2000	٨.٧١	5
6-	Plastic bags	1700	٧.٤٠	6
7-	Plastic cup	1350	٥.٨٨	7
8-	Tree leaves	1300	٥.٦٥	8
9-	Cartons	1200	٥.٢٢	9
10-	Organic waste	1100	٤.٧٨	10
11-	Chalk	700	٣.٠٤	11
12-	Plastic bottles	500	2.17	12
13-	Pencil	450	1.95	13
14-	Pen	170	0.77	14
15-	Waste incineration	0	0	15
	Total	22970	100 %	

Table (5.2) showed that textbooks and notebooks paper is the largest amount of waste (17.42%), followed by chips bags (13.94%), then soft drinks steel cans (13.06%). This evidence showed that Mariam-farahat school students participate in the same Featured, which use a lot of paper and burn it in the waste containers in the school, and this reflects the nature of the students who lives in camps and social nature that she inherited at the disposal of private paper waste.

It is noticeable that remnants of chips bags waste and which took the place in school waste, which showed a love for the students' chips unlike the students they had remnants of burned paper's second largest school waste.

It is noted in this school because there is no fuel waste due diligence in the management of that school hygiene, preservation and also the relentless and constant communication with the municipality of Rafah in the special school unloading waste container school almost daily.

Table (5.3) : Shafa-Amer school waste (female students):

No.	School Waste type	Weight by gm.	%	Rank
1-	Waste incineration	4500	١٤.١١	1
2-	Paper	4300	١٣.٤٨	2
3-	Chips bags	4100	١٢.٨٧	3
4-	Carton bottles	3500	١٠.٩٨	4
5-	Organic waste	3000	٩.٤	5
6-	Tree leaves	3100	٩.٧٢	6
7-	Cartons	2300	٧.٢١	7
8-	Steel cans	2200	6.9	8
9-	Plastic bags	1250	٣.٩٢	9
10-	Smooth paper	1200	٣.٧٦	10
11-	Chalk	830	٢.٦٠	11
12-	Plastic bottles	750	2.35	12
13-	Plastic cup	380	1.19	13
14-	Pencil	350	1.10	14
15-	Pen	130	0.41	15
	Total	31890	100 %	

Table (5.3) showed that the waste incineration is the largest school waste (14.11%), followed by paper (13.48%), then chips bags (12.86%). This shows that nature of inhabitations of eastern regions of disposing of waste paper which is burning, and help students prepare great on it.

As noted in Shafa-Amer school it contains the largest amount of waste chalk from among the four targeted schools, and this is likely a lack of knowledge of students in the

health problems, caused by the chalk on the chest and the process of respiration, as it evidenced by the negligence charge of hygiene in cleaning the waste.

Table (5.4): Al-Shoka school waste (female students):

No.	School Waste type	Weight by mg.	%	Rank
1-	Waste incineration	5500	21.12	1
2-	Organic waste	4000	١٥.٣٦	2
3-	Paper	3500	١٣.٤٤	3
4-	Tree leaves	2400	٩.٢٣	4
5-	Carton bottles	2300	٨.٨٣	5
6-	Cartons	2000	٧.٦٨	6
7-	Chips bags	1700	٦.٥٣	7
8-	Plastic bags	1200	٤.٦١	8
9-	Steel cans	1000	3.84	9
10-	Smooth paper	800	3.07	10
11-	Plastic bottles	500	1.93	11
12-	Chalk	400	1.54	12
13-	Pencil	350	1.35	13
14-	Plastic cup	250	0.97	14
15-	Pen	130	0.49	15
	Total	26030	100 %	

Table (5.4) showed that the waste incineration is the largest school waste (21.12%), followed by Organic waste (15.36%), then Paper (13.44%). This shows that nature of people living in East, the border areas of disposing of household burning, and benefit from waste fire, as we note in Al-Shoka school high in organic waste such as bread, this indicates the nature of the students, and lack of the ability to buy sandwiches ,chips and

drinks in the rest, because of the nature of the rural province, the biggest on the house bread, accreditation, and took him to school. It also shows a lack of the remnants of chalk, and this indicates a lack of blockbuster villagers students to study, such as rest areas.

Figure (5.2): Waste Management in Secondary Schools, Rafah from schools to the landfill.

In this picture it's clear that after school waste collection in a large private container for trash, then assemble those school waste by car for the municipality of Rafah, waste collection, and taking it to the Rafah waste landfill in Tal Al-Sultan area, there begins the process of waste sorting by potential existing, this can only be achieved if there is a foreign body supportive of this project, those waste collected in large spools and enclosed by a wall of cement or sand and buried.

When asked health supervisor in the municipality for the level of hygiene in schools and how to transfer those wastes replied that it was due to lack of diesel delayed, waste transport by vehicle for schedule to go to schools and unloading of containers, hygiene, and said there was a team Health supervisors to oversee those schools and his work meetings with school students and make them aware of environmental hygiene and the

importance of preserving the environment and has said he is missing the municipal young talent that you must turn seriously and without lazily as the irregular salary in the municipality leads to chill in the work of the staff and therefore this is reflected in their performance.

Figure (5.3): School Environment and Health Education.

Studies have stated the results of interventions to reduce infection through improvements in drinking water, sanitation facilities, and hygiene practices in developing countries (Hartinger et al., 2012). School environment influences personal hygiene and wellbeing of students through:

School and water facilities

Where sanitation facilities are poorly planned and constructed, badly maintained, used incorrectly their construction can set up additional possible disease transmission routes and lead to infection of the environment (WHO, 2005).

Schools with lack water will lead to poor cleanliness and hygiene conditions, which form high-risk environments for students and staff, and aggravate students particular weakness to environmental health risks (Adams et al., 2009).

Hand washing and Toilet facilities

According to UNICEF (2012), "Promoting hand washing without a supply of soap and water is like having a bowl without food in it". Hand washing is essential for good health, Curtis and Cairn cross (2003) found that washing hands with soap can reduce the risk of diarrhoea by 42 to 47 present.

Facilities for academic and non-academic activities need to be correctly put in place to provide an optimum sanitary environment which is harmless and beneficial for physical, mental and emotional health of the students in order to achieve extreme welfares from educational programs (Abigail et al, 2012).

Hygiene education classes

Students should be taught about the importance of personal hygiene and hand washing from as early as the basis stage. In Gaza, the hygiene and sanitation taught at least once a month but more often once a week (UNICEF, 2012).

5.3 Ethical considerations

1- Approval from the university.
2- Approval from the Ministry of Education.
3- Approval of the student to study.

Expert comments and suggestions were collected and evaluated carefully. All the suggested comments and modifications were discussed with the supervisor before taking them into consideration. At the end of this process, some minor changes, modifications and additions were introduced to the questions and the final questionnaire was constructed.

To get evidence for the internal consistence validity of the questionnaire, correlation coefficients were used as follows. This is shown in table (5.5), (5.6), (5.7), and (5.8)

- Correlation between each item and total score of knowledge
- Correlation between every item and total score of practice
- Correlation between every item and total score of attitude
- Correlation between total score of each dimension and overall total score.

Table (5.5): Correlation between each item and total score of knowledge

	Item	Value r	Value SIG.
1.	Do you know the principle of waste minimization?	٠.867	٠.000**
2.	Do you think that local authorities should take suitable steps in waste management?	0.872	0.000**
3.	Do you know about segregation of waste?	0.913	0.000**
4.	There is a connection between the school environment waste and morbidity?	0.819	0.000**
5.	There is a relation between the school environment waste and respiratory diseases?	0.884	0.000**
6.	Do you know the effective mechanism for school waste management?	0.846	0.000**
7.	Do you know the complications of improper waste management?	0.883	0.000**
8.	Do you know how to dispose the waste?	0.874	0.000**
9.	Are you eager to know about environmental problems?	0.877	0.000**
10.	Did you know that there are laws to protect the environment?	0.889	0.000**

* Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).

Table (5.6): Correlation between every item and total score of practice

	Item	Value r	Value SIG.
1.	Do you have to take part in minimize the waste?	٠.853	٠.000**
2.	Do you segregate house hold wastes?	0.905	٠.000**
3.	Does your school use a waste as a compost?	0.850	٠.000**
4.	Do you throw your waste outside your school?	0.889	٠.000**
5.	Do you see garbage on roadside while coming to school?	0.846	٠.000**
6.	Does the school administration work and use preventive measures against environmental waste pollution?	0.856	٠.000**
7.	Do you participate in student activities to get rid of environmental waste in your school?	0.849	٠.000**
8.	Do you use waste containers in the school to get rid of trash	0.875	٠.000**

	Item	Value r	Value SIG.
	during the study in a classroom?		
9.	Have you ever participated in workshops and activities in the school about healthy school environmental waste?	0.823	٠.000**
10.	Do you prepare a poster about environmental waste in schools?	0.887	٠.000**

* Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).

Table (5.7) : Correlation between every item and total score of attitude

	Item	Value r	Value SIG.
1.	Improper waste disposal is a threat to environment.	0.775	0.000**
2.	School waste management is the responsibility of my school administration.	0.848	0.000**
3.	School waste disposal is the responsibility of the local authorities.	0.869	0.000**
4.	I am also responsible for the generation of school waste.	0.914	0.000**
5.	There is a problem of environmental waste management in the school.	0.816	0.000**
6.	Chalk used at schools is a major consequence of school environmental waste pollution.	0.762	0.000**
7.	Chalk used at schools is a major consequence of student health problem.	0.661	0.000**
8.	Mass media should talk environmental waste management problem into consideration.	0.697	0.000**
9.	Student should be aware of the consequence of school environmental waste pollution.	0.770	0.000**
10.	I think there is a relation between the environmental waste in schools and the spread of diseases among students.	0.672	0.000**
11.	I think there should be commitment in the laws and	0.743	0.000**

	Item	Value r	Value SIG.
	legislation to limit the school environmental waste pollution.		
12.	Waste is an environmental problem.	0.743	0.000**

* Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).

Table (5.8) : Reliability estimates and Spearman-Brown Coefficient split half

Factors	N of items	Correlation	Spearman-Brown	Cronbach's Alpha
Knowledge	10	0.950	0.974	0.965
Practice	10	0.955	0.977	0.962
Attitude	12	0.827	0.905	0.939
Total	32	0.962	0.980	0.984

Cronbach alpha coefficient was calculated and the result illustrated that the range from 0.962 and 0.939 and the general reliability for all items equaling 0.984. This range is considered high; the result ensures the reliability of the questionnaire. Reliability refers to the consistency of responses on self-report, norm-referenced measures of attitudes and behavior (Kamphaus and Frick, 2005).

Statistical analysis

To achieve the research goal, researcher used the statistical package for the Social Science (SPSS) for Manipulating and analyzing the data. The type of study is descriptive analytic style.

Statistical methods are as follows:

- Descriptive statistics
- Person correlation coefficients.
- Independent samples T test.
- One way ANOVA.

Table (5.9) : Background characteristic of study sample (N=153)

Variable		N	Percent %
Gender	Male	41	26.79
	Female	112	73.21
Age	17 years	٧٧	٥٠.٣
	18 years	٧٦	٤٩.٧
Branch	Scientific Stream	٦١	٣٩.٩
	Literary Stream	٩٢	٦٠.١
Student average at last year's	Good and less	٢١	١٣.٧
	Very good	٣٧	٢٤.٢
	Excellent	٩٥	٦٢.١
Student health status	Healthy	١٤٧	٩٦.١
	Disease	٦	٣.٩
Father educational level	Primary and less	١٢	٧.٨
	Prep.	١٦	١٠.٤٦
	Secondary	٣٧	٢٤.٢
	Univ.	٨٨	٥٧.٥
Mother education level	Primary and less	١١	٧.٢
	Prep.	١٧	١١.١
	Secondary	٥٤	٣٥.٣
	Univ.	٧١	٤٦.٤
Father job	Work	١٠٣	٦٧.٣
	Not work	٥٠	٣٢.٧
Mother job	Work	٢٠	١٣.١
	Not work	١٣٣	٨٦.٩
Family income	Less than 1000	١١٥	٧٥.٢
	1000-2000	٨	٥.٢

Variable		N	Percent %
	2100-3000	١٦	١٠.٥
	more than 3001	١٤	٩.٢
Address	City	١٧	١١.١
	Camp	٩٦	٦٢.٧
	Village	٤٠	٢٦.١

Table (5.9) shows that 60.1% of student under literary stream branch, and the most of them have very excellent average at the last year which represent 62.1%.

Regarding student's father and mother educational level, the study shows that 57.5% of student have father university level and only 7.8% of them have primary and less level. While for mother level finding also shows close percentage for his husband level.

Also the table illustrate that 32.7% of student father had not work, and 86.7% of mother not work. Illustrates the distribution of students by household income. household income divided into 3 main categories: less than 1000 NIS, 1000-2000 NIS, 2100-3000, and more than 3001 NIS. This shows that, most of them have income less than 1000 NIS which represent 75.2%. Finding also present that 62.7% of the students live in camp and only 11.1% live in city.

5.3.1 Students' knowledge, attitude, and practice about environmental health hazard

Table (5.10) : Central tendency measures of KAP about environmental health hazard "frequency, mean, median and standard deviation"

Palliative care domains	No. of items	Mean	S.D.	Rank
Knowledge	10	4.141	0.416	2
Practice	9	3.490	0.490	3
Attitude	12	4.296	0.354	1
Overall scores	**31**	**3.976**	**0.309**	

The researcher assigned scores to the responses with giving higher score to high knowledge, practice and attitude of students and lower scores to responses with low

score. After grouping the questions for each domain and computing scores, mean percentage is revealed with higher mean percentages indicating a good knowledge, practice and attitude and vice versa. For the negatively phrased questions, codes were inversed. The overall mean percentage for students' KAP domains scores ranged from 69.8% to 82.8%.

The highest revealed mean score was for knowledge domain (10 questions) which reflects positive knowledge toward them. The lowest level was for the practice domain, which means that a negative practice toward waste management. The overall mean percentage reflecting all scores was 79.5%, which is regarded as a good.

Finding are consistent with Sarsour study (2007) about knowledge of environmental health hazard, the study results inconsistent with the result of my study which showed that the level of environmental knowledge among the governmental high basic schools children of class nine in GS was (70.2%) relatively moderate, the level of positive environmental attitude was (64.33%) relatively low, this could be that the sample of my study smaller than (Sarsour, 2007) sample study.

5.3.1.1 Knowledge domain

Table (5.11) : Descriptive statistics for the students' knowledge about environmental health hazard

Knowledge Item	Mean	S.D.	Rank
Do you know the principle of waste minimization?	4.268	0.649	3
Do you think that local authorities should take suitable steps in waste management?	4.719	0.555	1
Do you know about segregation of waste?	3.673	0.937	10
There is a connection between the school environment waste and morbidity?	4.209	0.977	5
There is a relation between the school environment waste and respiratory diseases?	4.176	1.082	6
Do you know the effective mechanism for school waste management?	3.751	0.813	9
Do you know the complications of improper waste management?	3.784	0.979	8
Do you know how to dispose the waste?	4.255	0.756	4
Are you eager to know about environmental problems?	4.418	0.799	2

Knowledge Item	Mean	S.D.	Rank
Did you know that there are laws to protect the environment?	4.163	0.949	7
Total score of Knowledge domain	**4.141**	**0.416**	

Table (5.11) shows that the total mean score of knowledge domain consist 82.8% which mean that students have a very good knowledge about waste management. Item N. 2 with rank (1), get the highest weighted average which represent 94.3%. While the second statement get highest percentage state "Are you eager to know about environmental problems?" with 88.3%. In contrast, the item "Do you know about segregation of waste?" reach the lowest percentage that represent 73.4%, followed by item "Do you know the effective mechanism for school waste management?" which represent 75.0%.

5.3.1.2 Practice domain

Table (5.12) : Descriptive statistics for the students' practice about environmental health hazard

Practice Item	Mean	S.D.	Rank
Do you have to take part in minimize the waste?	4.679	0.533	1
Do you segregate house hold wastes?	3.954	1.102	3
Does your school use a waste as a compost?	1.712	0.997	9
Do you throw your waste outside your school?	2.496	1.343	8
Do you see garbage on roadside while coming to school?	4.483	1.045	2
Does the school administration work and use preventive measures against environmental waste pollution?	3.418	1.290	6
Do you participate in student activities to get rid of environmental waste in your school?	3.601	1.131	4
Do you use waste containers in the school to get rid of trash during the study in a classroom?	4.679	0.808	1
Have you ever participated in workshops and activities in the school about healthy school environmental waste?	3.084	1.432	5
Do you prepare a poster about environmental waste in schools?	2.797	1.294	7
Total score of Practice domain	**3.490**	**0.490**	

Table (5.12) present the descriptive analysis for the students' practice about environmental health hazard, we notes that the total mean score of practice domain consist 69.81% which mean that students have a good practice about waste management. The items “Do you have to take part in minimize the waste?” and “Do you use waste containers in the school to get rid of trash during the study in a classroom?” reach the highest weighted average which represent 93.59%. The statement “Do you see garbage on roadside while coming to school?” reach the highest second score with 89.67%. In contrast, the item “Do you know about segregation of waste?” reach the lowest percentage that represent 34.24%, followed by item “Does your school use a waste as a compost??” which represent 49.93%.

5.3.1.3 Attitude domain

Table (5.13) : Descriptive statistics for the students' attitude about environmental health hazard.

Attitude Item	Mean	S.D.	Rank
Improper waste disposal is a threat to environment.	4.843	0.430	1
School waste management is the responsibility of my school administration.	4.032	0.989	10
School waste disposal is the responsibility of the local authorities.	3.679	1.086	11
I am also responsible for the generation of school waste.	4.634	0.646	4
There is a problem of environmental waste management in the school.	3.457	1.069	12
Chalk used at schools is a major consequence of school environmental waste pollution.	4.058	0.974	9
Chalk used at schools is a major consequence of student health problem.	4.091	0.905	8
Mass media should talk environmental waste management problem into consideration.	4.562	0.657	5
Student should be aware of the consequence of school environmental waste pollution.	4.477	0.698	6
I think there is a relation between the environmental waste in schools and the spread of diseases among students.	4.287	0.900	7
I think there should be commitment in the laws and legislation to limit the school environmental waste pollution.	4.647	0.567	3

Attitude Item	Mean	S.D.	Rank
Waste is an environmental problem.	4.790	0.546	2
Total score of attitude domain	**4.296**	**0.354**	
Total Scores of environmental health hazard	**3.976**	**0.309**	

Table (5.13) present the descriptive analysis for the students' practice about environmental health hazard, we observe that total mean score of attitude domain consist 79.53%. In addition, this table shows that the highest score was observe in the item "Improper waste disposal is a threat to environment", followed by "Waste is an environmental problem". The lowest score was observed in the items "There is a problem of environmental waste management in the school", followed by "School waste disposal is the responsibility of the local authorities" and "School waste management is the responsibility of my school administration".

Inferential Statistic

Inferential analysis was used in this study to explore the relationship independent variables and dependent variables KAP, inferential analysis as illustrated below.

Socio-demographic

Students' knowledge, attitudes and practices related to gender

Table (5.14) : Differences in students' knowledge, attitudes and practices related to gender

Variable	Gender	N	Mean	Std. Deviation	P-value
Knowledge	Male	65	4.113	.422	.477
	Female	88	4.162	.413	
Practice	Male	65	3.507	.541	.716
	Female	88	3.478	.451	
Attitude	Male	65	4.268	.381	.389
	Female	88	4.318	.334	
Total Scores	Male	65	3.963	.342	.648

	Female	88	3.986	.283	

*The value of t at df (151) and significance level 0.05 =1.66
The value of t at df (151) and significance level 0.01 = 2.36**

The researcher used independent sample t-test to investigate the differences between males and females with regard to dependent variable. We notes that female students elected the highest mean score in knowledge, attitude and total score domain. The difference between male and female not reach statistical significant difference at ($\alpha \leq 0.05$) in knowledge, attitudes and practices for environmental health hazard. This means that the students' males and females have the same levels of knowledge, practice and attitude regarding to waste management. These is a study conducted (in-consistent) by (Mohsen, 2003), which revealed that students' have significant higher level of knowledge in relation to different environmental tropics.

Students' knowledge, attitudes and practices related to age

Table (5.15) : Independent T-test comparing means of in environmental health hazard according to age**.**

Variable	Gender	Age	N	Mean	Std. Deviation	P-value
Knowledge	Male	17	77	4.127	0.436	0.665
	Female	18	76	4.156	0.397	
Practice	Male	17	77	3.520	0.520	0.449
	Female	18	76	3.460	0.459	
Attitude	Male	17	77	4.357	0.350	0.034**
	Female	18	76	4.235	0.350	
Total Scores	Male	17	77	4.001	0.315	0.311
	Female	18	76	3.951	0.302	

*The value of t at df (151) and significance level 0.05 =1.66
The value of t at df (151) and significance level 0.01 = 2.36**

Independent sample t-test was used to investigate the differences between students age (17-18 years) with regard to dependent variable. We observe that students whose age 17 years elected the highest mean score in attitude and total score domain (4.35-4.00 respectively). The difference between age and KAP not reach statistical significant difference at ($\alpha \leq 0.05$) in knowledge, attitudes and total scores for environmental health hazard except attitude domain. The difference was favour for students age 17 years.

Also, in a local study of Affifi (2000) which was conducted on the 400 sixth grade students in Rafah governorate, where the results revealed a lower level of environmental enlightenment of the students (65.3%) than the accepted standard of the established study which is 80%. In addition, the study results disagree with the study conducted in the occupied Palestinian region since 1948, which reported that the level of environmental awareness about different environmental issues among students of academic institution for preparing Arab teachers and students of grade nine of the elementary school was very low (Naser and Naser, 2000). Another findings were in contrast to this study finding across different countries, in Oman Sultanate (Salmi and Mekhlafy, 2003); in Hong Kong (Sheila, 2004) and in Iran (Ehrampoush, 2005). This variation can be attributed to the differences in cultures and environmental education materials applied in their schools curriculum in different communities.

Students' knowledge, attitudes and practices regarding to branch

Table (5.16) : Independent T-test comparing means of environmental health hazard according to branch

Variable	Branch	N	Mean	Std. Deviation	P-value
Knowledge	Scientific Stream	61	4.080	.440	.138
	Literary Stream	92	4.182	.397	
Practice	Scientific Stream	61	3.488	.514	.962
	Literary Stream	92	3.492	.476	
Attitude	Scientific Stream	61	4.266	.385	.389
	Literary Stream	92	4.317	.333	
Total Scores	Scientific Stream	61	3.945	.327	.307
	Literary Stream	92	3.997	.296	

The value of t at df (151) and significance level 0.05 =1.66*
**The value of t at df (151) and significance level 0.01 = 2.36

Table (5.16) shows the differences between students' branch with regard to dependent variable. It shows that students in literary branch elected the highest mean score in all study domains KAP and total score. The difference between two group not reach statistical significant difference at ($\alpha \leq 0.05$) in knowledge, attitudes and practices among students for environmental health hazard due to branch. This means that the students' in scientific or literary branch have the same levels of KAP regarding to waste management.

Students' knowledge, attitudes and practices regarding to father job

Table (5.8): Independent T-test comparing means of burnout according to father Job

Variable	Father Job	N	Mean	Std. Deviation	P-value
Knowledge	Work	103	4.201	0.409	.010**
	Not work	50	4.018	0.406	
Practice	Work	103	3.476	0.461	0.610
	Not work	50	3.520	0.548	
Attitude	Work	103	4.325	0.355	0.156
	Not work	50	4.238	0.351	
Total Scores	Work	103	4.001	0.295	0.155
	Not work	50	3.925	0.331	

The value of t at df (151) and significance level 0.05 =1.66*
**The value of t at df (151) and significance level 0.01 = 2.36

Table (5.17) shows the difference in KAP among students for environmental health hazard due to father Job. We shows that students' whose father is work get the highest mean score in study domains knowledge, attitude and total score. Also, the table shows that there are no significant statistical differences at ($\alpha \leq 0.05$) in knowledge, attitudes and practices among students for environmental health hazard due to gender due to father Job except knowledge is significant statistical returned to work.

Students' knowledge, attitudes and practices regarding to mother job

Table (5.18): Independent T-test comparing means of environmental health hazard according to mother Job

Variable	Mother Job	N	Mean	Std. Deviation	P-value
Knowledge	Work	20	4.210	0.434	0.434
	Not work	133	4.131	0.414	
Practice	Work	20	3.555	0.438	0.532
	Not work	133	3.481	0.498	
Attitude	Work	20	4.358	0.320	0.408
	Not work	133	4.287	0.360	
Total Scores	Work	20	4.041	0.270	0.318
	Not work	133	3.966	0.314	

*The value of t at df (151) and significance level 0.05 =1.66
**The value of t at df (151) and significance level 0.01 = 2.36

Table (5.18) shows difference in KAP among students for environmental health hazard due to mother Job. We shows that students whose mother is work get the highest mean score in all study domains (knowledge, practice, attitude and total score). Additionally, the table shows that there are no significant statistical differences at ($\alpha \leq 0.05$) in KAP among students for environmental health hazard due to mother Job.

Students' knowledge, attitudes and practices regarding to health condition

Table (5.19) : Independent T-test comparing means of environmental health hazard according to health condition

Variable	Health	N	Mean	Std. Deviation	P-value
Knowledge	Healthy	147	4.157	0.410	0.018*
	Disease	6	3.750	0.398	
Practice	Healthy	147	3.500	0.488	0.221
	Disease	6	3.250	0.512	
Attitude	Healthy	147	4.298	0.356	0.817
	Disease	6	4.263	0.347	
Total Scores	Healthy	147	3.985	0.305	0.073
	Disease	6	3.754	0.343	

*The value of t at df (151) and significance level 0.05 =1.66
**The value of t at df (151) and significance level 0.01 = 2.36

Table (5.19) that no significant statistical differences at ($\alpha \leq 0.05$) in KAP among students for environmental health hazard due to health except Knowledge is significant statistical returned to Healthy.

Students' knowledge, attitudes and practices regarding to average

Table (5.9) : Differences in knowledge, attitudes and practices scores of students according to average

Factor	Variable	N.	Mean	Std. Deviation
Knowledge	Good and less	21	3.866	0.381
	Very good	37	4.073	0.459
	Excellent	95	4.229	0.377
Practice	Good and less	21	3.404	0.563
	Very good	37	3.521	0.516
	Excellent	95	3.497	0.465
Attitude	Good and less	21	4.194	0.369
	Very good	37	4.216	0.365
	Excellent	95	4.350	0.340
Total	Good and less	21	3.822	0.336
	Very good	37	3.936	0.336
	Excellent	95	4.026	0.280
	Total	153	3.976	0.309

Means and standard deviations distribution of quality of students' KAP regarding to average are presented in table (5.20). Findings showed that students with excellent average had better mean scores in all study domains.

These findings agree with the results of Affifi (2000) which revealed that there was a strong relation between the level of environmental enlightenment and the academic level of achievement of the students in favor to excellent achiever.

Table (5.21) : One-way ANOVA comparing environmental health hazard according to average

Variable	Source of variable	Sum of Squares	Df	Mean Square	F value	Sig. level
Knowledge	Between Groups	2.495	2	1.248	7.831	0.001**
	Within Groups	23.897	150	٠.159		
Practice	Between Groups	0.195	2	0.098	0.403	0.669
	Within Groups	36.352	150	٠.242		
Attitude	Between Groups	0.738	2	0.369	3.007	0.052
	Within Groups	18.412	150	٠.123		
Total Scores	Between Groups	0.793	2	0.397	4.332	0.015**
	Within Groups	13.728	150	0.092		
	Total	14.521	152			

*The value of F at df (3, 149) and significance level 0.05 =2.67
**The value of F at df (3, 149) and significance level 0.01 = 3.92

One-way ANOVA test was used to represent the differences between the scores of students' KAP regarding to average as illustrated in table (5.21). Findings showed that there were statistically significant differences at ($\alpha \leq 0.05$) in KAP among students for environmental health hazard due to average except practice and attitude.

Table (5.10) : Scheffe test for measure mean difference environmental health hazard according to average

Dependent Variable	(I) average	(J) average	Mean Difference (I-J)	Sig.
Knowledge	Excellent	Good and less	0.362	0.001**
Total	Excellent	Good and less	0.204	0.022*

***The mean difference is significant at the 0.05 level
**The mean difference is significant at the 0.01 level

Post – hoc analysis was performed. It indicated that there significant differences in the dimension and total score of burnout. Results in the following table show that the holders of the Excellent have significantly higher scores in knowledge than the holders of good and less. Moreover, the holders of excellent have significantly higher scores in total compared to holders of good and less.

Students' knowledge, attitudes and practices due to father education level

Table (5.11) : Differences in knowledge, attitudes and practices scores of students according to father education level

Factor	Variable	N	Mean	Std. Deviation
Knowledge	Primary and less	12	3.875	0.490
	Prep.	16	4.281	0.350
	Secondary	37	4.116	0.412
	Univ.	88	4.163	0.408
Practice	Primary and less	12	3.116	0.454
	Prep.	16	3.706	0.576
	Secondary	37	3.529	0.464
	Univ.	88	3.486	0.467
Attitude	Primary and less	12	4.208	0.310
	Prep.	16	4.442	0.235
	Secondary	37	4.198	0.401
	Univ.	88	4.323	0.349
Total	Primary and less	12	3.733	0.317
	Prep.	16	4.143	0.285
	Secondary	37	3.948	0.301
	Univ.	88	3.991	0.297
	Total	153	3.976	0.309

Means and standard deviations distribution of quality of students' KAP regarding to father education level are presented in table (5.23). Findings showed that students whose father have preparatory level had better mean scores in all study domains.

Table (5.12) : One-way ANOVA comparing environmental health hazard according to father education level

Variable	Source of variable	Sum of Squares	df	Mean Square	F value	Sig. level
Knowledge	Between Groups	1.232	3	0.411	2.431	٠.067
	Within Groups	25.161	149	٠.169		
Practice	Between Groups	2.480	3	0.827	3.616	*.015
	Within Groups	34.067	149	٠.229		
Attitude	Between Groups	0.859	3	0.286	2.332	٠.077
	Within Groups	18.292	149	٠.123		
Total Scores	Between Groups	1.204	3	0.401	4.492	**.005
	Within Groups	13.316	149	0.089		
	Total	14.521	153			

The value of F at df (3, 149) and significance level 0.05 =2.67*
**The value of F at df (3, 149) and significance level 0.01 = 3.92

One-way ANOVA test was used to represent the differences between the scores of students' knowledge, attitudes and practices regarding to father educational level in table(5.24). Findings showed that there were statistically significant differences at ($\alpha \leq 0.05$) in KAP among students for environmental health hazard due to father educational level except knowledge and attitudes.

Table (5.25) : Scheffe test for measure Mean difference to father education level

Dependent Variable	(I) father education	(J) father education	Mean Difference (I-J)	Sig.
Practice	Primary and less	Prep.	.58958	.018*
Total	Primary and less	Prep.	.41007	.006**

*The mean difference is significant at the 0.05 level
**The mean difference is significant at the 0.01 level

Post – hoc analysis was performed, it indicated that there was a significant differences in the practice dimension and total score. Results show that holders of the Primary and less have significantly higher scores in practice dimension and total score than the holders of Prep.'s degree.

Students' knowledge, attitudes and practices due to mother education level

Table (5.26) : Differences in knowledge, attitudes and practices scores of students according to father education level

Factor	Variable	N	Mean	Std. Deviation
Knowledge	Primary and less	11	4.109	0.436
	Prep.	17	4.205	0.300
	Secondary	54	4.116	0.436
	Univ.	71	4.150	0.427
Practice	Primary and less	11	3.272	0.490
	Prep.	17	3.547	0.539
	Secondary	54	3.529	0.532
	Univ.	71	3.481	0.444
Attitude	Primary and less	11	4.250	0.278
	Prep.	17	4.328	0.380
	Secondary	54	4.243	0.398
	Univ.	71	4.336	0.323
Total	Primary and less	11	3.877	0.325
	Prep.	17	4.027	0.203
	Secondary	54	3.963	0.349
	Univ.	71	3.989	0.296
	Total	153	3.976	0.309

Means and standard deviations distribution of quality of students' KAP regarding to mother education level shows in table (5.26). Findings showed that students whose mother have preparatory educational level had better mean scores in all study domains except attitude domain which favour for mother had university educational level, explain causes differences the fathers who completed prep. school are from working-class and who live camps that the population they were expelled from their country to tack camps after the Zionist occupation in 1948. also maintain the cleanliness of their homes and camps because of their small place that has become a culture in their lives.

Table (5.27) : One-way ANOVA comparing environmental health hazard according to mother education level.

Variable	Source of variable	Sum of Squares	Df	Mean Square	F value	Sig. level
Knowledge	Between Groups	0.121	3	0.040	0.229	0.876
	Within Groups	26.271	149	٠.176		
Practice	Between Groups	0.664	3	0.221	0.919	0.433
	Within Groups	35.883	149	٠.241		
Attitude	Between Groups	0.307	3	0.102	0.808	0.491
	Within Groups	18.844	149	٠.126		
Total Scores	Between Groups	0.174	3	0.058	0.601	0.615
	Within Groups	14.347	149	0.096		
	Total	14.521	153			

*The value of F at df (3, 149) and significance level 0.05 =2.67
The value of F at df (3, 149) and significance level 0.01 = 3.92**

Table (5.27) shows that no significant statistical differences at ($\alpha \leq 0.05$) in KAP among students for environmental health hazard due to mother education level.

Students' knowledge, attitudes and practices due to family monthly income

Table (5.28) : Differences in knowledge, attitudes and practices scores of students according to family monthly income

Factor	Variable	N	Mean	Std. Deviation
Knowledge	Less than 1000	١١٥	4.118	0.421
	1000-2000	٨	4.187	0.253
	2100-3000	١٦	4.206	0.479
	more than 3001	١٤	4.235	0.391
Practice	Less than 1000	١١٥	3.462	0.489
	1000-2000	٨	3.625	0.332
	2100-3000	١٦	3.418	0.549
	more than 3001	١٤	3.728	0.468
Attitude	Less than 1000	١١٥	4.292	0.357
	1000-2000	٨	4.281	0.375
	2100-3000	١٦	4.286	0.395
	more than 3001	١٤	4.351	0.308
Total	Less than 1000	١١٥	3.957	0.310
	1000-2000	٨	4.031	0.185
	2100-3000	١٦	3.970	0.357
	more than 3001	١٤	4.105	0.284
	Total	153	3.976	0.309

Means and standard deviations distribution of quality of students' KAP regarding to mother education level are presented in table (5.28). Findings showed that students whose family have income more than 3000 NIS had better mean scores in all study domains.

Table (5.29) : One-way ANOVA comparing environmental health hazard according to family monthly income

Variable	Source of variable	Sum of Squares	Df	Mean Square	F value	Sig. level
Knowledge	Between Groups	.270	3	.090	.514	.673
	Within Groups	26.122	149	.175		
Practice	Between Groups	1.110	3	.370	1.556	.203
	Within Groups	35.437	149	.238		
Attitude	Between Groups	.047	3	.016	.122	.947
	Within Groups	19.103	149	.128		
Total Scores	Between Groups	.296	3	.099	1.034	.379
	Within Groups	14.225	149	.095		
	Total	14.521	153			

*The value of F at df (3, 149) and significance level 0.05 =2.67
**The value of F at df (3, 149) and significance level 0.01 = 3.92

Table (5.29) showed that there is no significant statistical differences at ($\alpha \leq 0.05$) in KAP among students for environmental health hazard due to income.

Students' knowledge, attitudes and practices due to address

Table (5.30) : Differences in knowledge, attitudes and practices scores of students according to address

Factor	Variable	N	Mean	Std. Deviation
Knowledge	City	17	4.000	0.459
	Camp	96	4.158	0.384
	Village	40	4.162	0.468
Practice	City	96	3.570	0.607
	Camp	40	3.502	0.476
	Village	17	3.430	0.475
Attitude	City	40	4.362	0.303
	Camp	17	4.302	0.357
	Village	96	4.254	0.372
Total	City	17	3.977	0.361
	Camp	96	3.987	0.288
	Village	40	3.948	0.338
	Total	17	3.976	0.309

Means and standard deviations distribution of quality of students' KAP regarding to mother education level are presented in table (5.30). Findings showed that students' lived in city had better mean scores in practice and attitude domains.

Table (5.31) : One-way ANOVA comparing environmental health hazard according to address

Variable	Source of variable	Sum of Squares	Df	Mean Square	F value	Sig. level
Knowledge	Between Groups	.385	2	.193	1.111	.332
	Within Groups	26.007	150	.173		
Practice	Between Groups	.268	2	.134	.555	.575
	Within Groups	36.279	150	.242		
Attitude	Between Groups	.150	2	.075	.593	.554
	Within Groups	19.000	150	.127		
Total Scores	Between Groups	.043	2	.021	.221	.802
	Within Groups	14.478	150	.097		
	Total	14.521	152			

The value of F at df (3, 149) and significance level 0.05 =2.67*
**The value of F at df (3, 149) and significance level 0.01 = 3.92

Table (5.31) shows that there is no significant statistical differences at ($\alpha \leq 0.05$) in KAP among students for environmental health hazard due to address.

Impact of environmental health hazards from the generation of waste on students health

1- Dyspnea

Table (5.32) : Relationship between expose to waste generation dust and dyspnea

Variables	Exposed to dust of waste generation				Total	
	Yes		No			
Dyspnea	Frequency	%	Frequency	%	Frequency	%
Yes	37	42.5	50	57.5	87	**56.9**
No	22	33.3	44	66.7	66	**43.1**
	Chi square = 1.339			*P*-value = 0.247		

Table (5.32) shows that there is a relationship between exposure to waste generation dust and dyspnea. Finding showed that 87 (56.9%) of the students suffered from dyspnea; among them 37 (42.5%) exposed to waste generation dust. The relationship between exposure to waste generation dust and dyspnea not reached statistically significant level (P value= 0.247). Meaning that dust not effect on student health.

2- Cough

Table (5.13) : Relationship between expose to waste generation dust and cough

Variables	Exposed to dust of waste generation				Total	
	Yes		No			
Cough	Frequency	%	Frequency	%	Frequency	%
Yes	40	31.3	88	68.7	128	**83.6**
No	19	76.0	6	24.0	25	**16.4**
	Chi square = 17.678			*P*-value = 0.000		

Table (5.33) shows that there is a relationship between exposure to waste generation dust and cough. Finding showed that 128 (83.6%) of the students suffered from cough; among them 40 (31.3%) exposed to waste generation dust and 88 (68.7%) not exposed to waste generation dust. The relationship between exposure to waste generation dust and cough reached statistically significant level (P value= 0.000).

2- Vomiting

Table (5.34) : Relationship between expose to waste generation dust and vomiting

Variables	Exposed to dust of waste generation				Total	
	Yes		No			
Vomiting	Frequency	%	Frequency	%	Frequency	%
Yes	30	57.7	22	42.3	52	**33.9**
No	29	28.7	72	71.3	101	**66.1**
	Chi square = 12.167			*P*-value = 0.000		

Table (5.34) shows that there is a relationship between exposure to waste generation dust and vomiting. Finding showed that 52 (33.9%) of the students suffered from vomiting; among them 30 (57.7%) exposed to waste generation dust and 22 (42.3%) not exposed to waste generation dust. The relationship between exposure to waste generation dust and vomiting reached statistically significant level (P value= 0.000).

Observational Checklist:

Table (5.35) : Observational Checklist to four secondary school

Questions	Observed		Not Observed	
Items	**frequency**	**%**	**frequency**	**%**
There is a waste bins inside the classroom.	4	100	-	-
The classroom participates in any school recycling programs.	4	80	1	20
The school currently recycles any materials as a (food scraps, wood waste, Soda bottles, and books paper).	4	100		
The school adopts any steps to help reduce waste materials.	4	100		
The school adopts any steps to help reuse waste materials.			4	100
The school adopts any steps to help recycle waste materials.			4	100
All class room furniture clean.	2	40	3	60
All class room furniture in a good condition.	4	100		
The staff room use disposable cups.	4	100		
The staff room use reusable cups.	4	100		
The school compost organic waste.			4	100
The school has a rubbish collection service.	2	40	3	60
There a bad odors detectable inside the school building.	2	40	3	60
There is a waste management problem in the school.	3	60	2	40
There a proper labeling of waste bins with cover at classroom.	4	100	-	-
There a cough between students.	4	100	-	-
There a nose irritations between students.	4	100	-	-
There restlessness from school environmental waste between students.	2	40	3	60
Students wash their hands before and after eating breakfast.			4	100
There is a constant cleaning in the school cafeteria and supervisors from the administration.	4	100	-	-
There is a clean bathrooms facility's	4	80	1	20
The facility's bathrooms well ventilated	2	40	3	60

Observed that most schools have a waste bins inside the classroom with average 100%. In contrast, the researcher not observed that all class room furniture clean with average 40%.

Chapter six
Conclusion and Recommendations

Chapter six

Conclusion and Recommendations

6.1 Conclusion

Results show that 26.79% of survey student were males, and 73.19 were females, of the 153 students. Furthermore, 60.1% of them under literary stream branch, and the most of them have very excellent average at the last year. Additionally, most of them have income less than 1000 NIS which represent 75.2%. Regarding father job and KAP there is statistical significant P-value (0.010). Furthermore the finding show there is statistical significant deference's (0.05) in KAP for student due to father educational level. Regarding KAP about environmental health hazard, the overall mean percentage for students' domains scores ranged from 69.8% to 82.8% . Attitude elicited a higher scores (85.9%) followed but knowledge (82.8%), and practice elicited a lowest scores (69.8%). In regard the Observational Checklist showed that most school had a waste bins inside the classroom with 100%, and had a classroom furniture clean with average 40%.

Impact of environmental health hazards from the generation of waste on students health , examine the relationship between exposure to waste generation dust and dyspnea, findings showed that (56.9%) of the students suffered from dyspnea; among them (42.5%) exposed to waste product dust. The relationship between exposure to waste generation dust and dyspnea not reached statistically significant level (P value= 0.247) that’s mean dust not effect on student health.

The results show that there is a good background in environmental knowledge could eventually lead to development of positive attitude toward the environment.

Independent sample t-test to investigate the differences between males and females with regard to dependent variable, and notes that female students elected the highest mean score in knowledge, attitude and total score domain. The difference between male and female not reach statistical significant difference at ($\alpha \leq 0.05$) in KAP for environmental health hazard. This means that the students’ males and females have the same levels of KAP regarding to waste management.

The difference between two group not reach statistical significant difference at ($\alpha \leq 0.05$) in KAP among students for environmental health hazard due to branch. This means that

the students' in scientific or literary branch have the same levels of knowledge, practice and attitude regarding to waste management.

Means and standard deviations distribution of quality of students' knowledge, attitudes and practices regarding to mother education level are presented. Findings showed that students lived in city had better mean scores in practice and attitude domains.

There is a relationship between exposure to waste generation dust and dyspnea. Finding showed that 87 (56.9%) of the students suffered from dyspnea; among them 37 (42.5%) exposed to waste generation dust. The relationship between exposure to waste generation dust and dyspnea not reached statistically significant level

(P value= 0.247), Meaning that dust not effect on student health. Finding showed that 52 (33.9%) of the students suffered from vomiting; among them 30 (57.7%) exposed to waste generation dust and 22 (42.3%) not exposed to waste generation dust. The relationship between exposure to waste generation dust and vomiting reached statistically significant level (P value= 0.000).

6.2 Recommendations

It is recommended that the environment teachers should give more attention toward developing higher and deeper environmental concepts to increase the students attitude toward their environment, and to insure that must be applied in a qualified way. Students should understand that environmental problems are embedded in the existing political, economic and social systems. Non-formal environmental education programs should be increased and produced out of school timetable, such as environmental clubs, environmental summer camps and so on. As the students' will be the master of our future after few years, therefore we need to pay more attention toward improving their concern and commitments to protect the environment from further deterioration.

1- Environmental health curriculum should be applied on students' to enable them to have an equal opportunity as male students in developing their environmental concepts and attitude.
2- Conducting training courses for environmental curriculum teachers on how to improve and develop higher and deeper environmental concepts among students.
3- Environmental teachers should pay more attention to integrate concepts and principles of environmental issues into all opportunities for social learning in order to develop commitment toward protecting their environment.
4- Encourage establishing environmental awareness programs in non-disciplinary way to improve our students' environmental KAP.
5- Establishing community awareness program to advocate for positive environmental attitude among students, to insure improving our community as a whole and protecting our environment from further deterioration.

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Annexes

Annex I :Thesis Approval

بسم الله الرحمن الرحيم

الجامعة الإسلامية – غزة
The Islamic University - Gaza
مكتب نائب الرئيس للبحث العلمي والدراسات العليا هاتف داخلي 1150

الرقم Ref ج س غ/35/
2014/09/07
التاريخ Date

الأخ الدكتور/ وكيل وزارة التربية والتعليم العالي حفظهم الله،،

السلام عليكم ورحمة الله وبركاته،

تسهيل مهمة طالب ماجستير

تهديكم شئون البحث العلمي والدراسات العليا أطيب تحياتها، وترجو من سيادتكم التكرم بتسهيل مهمة الطالب/ **إياد عبدالكريم عطية عفانة، برقم جامعي 120120324**، المسجل في برنامج الماجستير بكلية **العلوم** تخصص **علوم بيئية – صحة بيئية** وذلك بهدف الحصول علي المعلومات التي تساعده في إعداد خطة الرسالة.

شاكرين لكم حسن تعاونكم،

مساعد نائب الرئيس للبحث العلمي والدراسات العليا

أ.د. فؤاد علي العاجز

صورة إلى:-
- الملف

P.O. Box 108, Rimal, Gaza, Palestine fax: +970 (8) 286 0800 فاكس Tel: +970 (8) 286 0700 ص.ب 108 الرمال غزة فلسطين هاتف
public@iugaza.edu.ps www.iugaza.edu.ps

Annex 2: Thesis approval from Ministry of Education and Higher education

بسم الله الرحمن الرحيم

Palestinian National Authority
Ministry of Education &Higher Education
General Directorate of Educational planning

السلطة الوطنية الفلسطينية
وزارة التربية والتعليم العالي
الادارة العامة للتخطيط التربوي

الرقم: و.ت.غ مذكرة داخلية (٢٠٢ / ٣)
التاريخ: 2015/3/29
الموافق: 9 جمادي الاخر، 1436هـ

السيد/ مدير التربية والتعليم- رفح **المحترم**

السلام عليكم ورحمة الله وبركاته،،،

الموضوع/ تسهيل مهمة بحث

نهديكم أطيب التحيات، ونتمنى لكم موفور الصحة والعافية، وبخصوص الموضوع أعلاه،

يرجى تسهيل مهمة الباحث/ إياد عبد الكريم عفانة والذي يجري بحثاً بعنوان :

"Waste Management and Health Impacts in Rafah Secondary Schools, Gaza strip, Palestine"

وذلك استكمالاً لمتطلبات الحصول على درجة الماجستير في كلية العلوم بالجامعة الإسلامية بغزة تخصص صحة البيئة، في تطبيق أدوات البحث على عينة من طلاب المرحلة الثانوية بمديريتكم الموقرة، وذلك حسب الأصول.

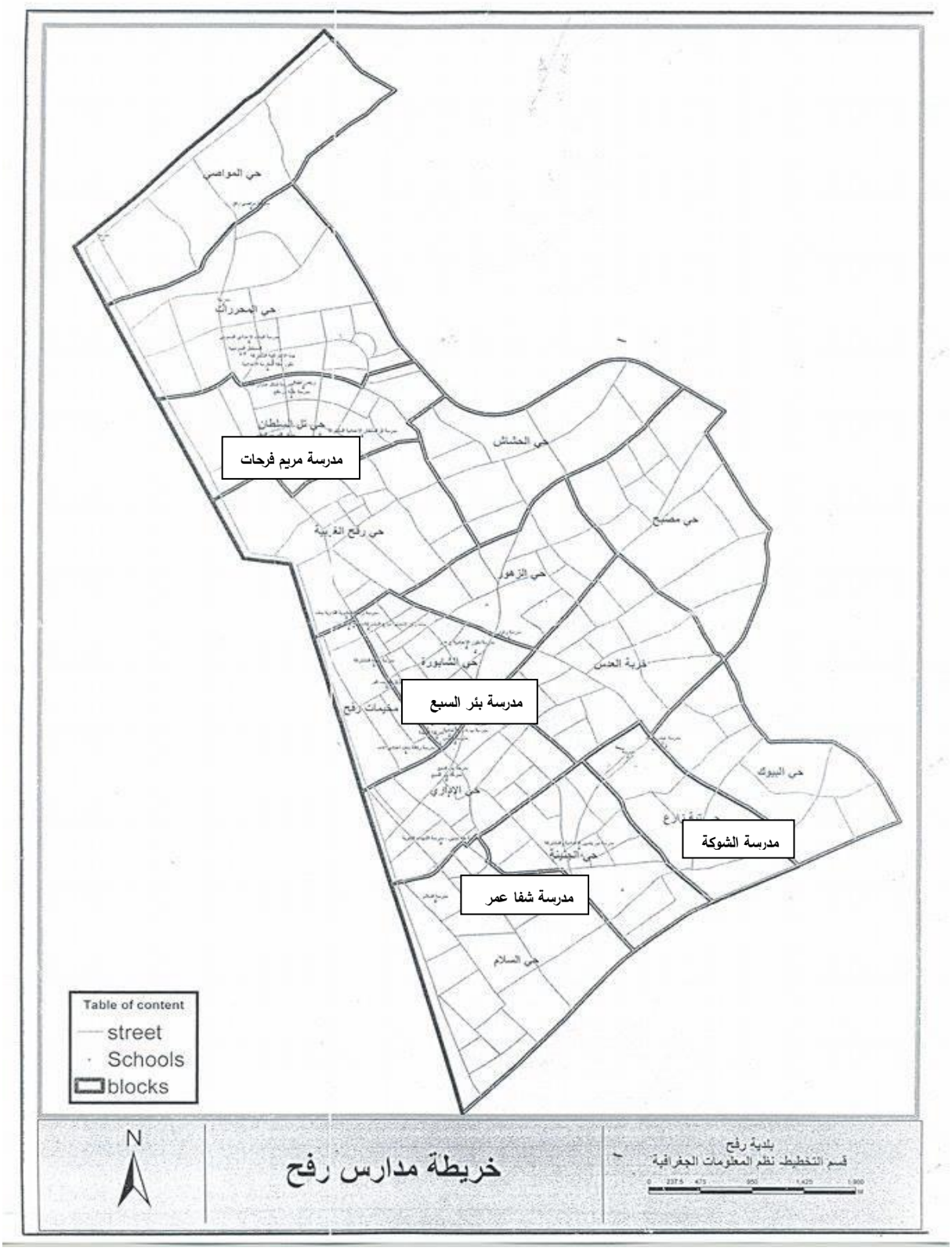
وتفضلوا بقبول فائق الاحترام،،،

د. علي عبد ربه خليفة
مدير عام التخطيط التربوي

نسخة:
- السيد/ وكيل وزارة التربية والتعليم العالي المحترم.
- السيد/ وكيل الوزارة المساعد للشئون الإدارية والمالية المحترم.
- الملف.

Gaza (08-2641298 – 2641297 Fax:(08-2641292)

Annex 3 : Map of Rafah City



Annex 4: Measure Tool

بسـم الله الرحمـن الرحيم

السيد/ _____ حفظه الله

تحية طيبة وبعد،

يقوم الباحث بإجراء دراسة بعنوان:

" Waste Management and Health Impacts in Rafah Secondary Schools, Gaza Strip, Palestine"

كمتطلب للحصول على درجة الماجستير في العلوم البيئية تخصص صحة البيئة

لذا قام الباحث بإعداد أداة قياس للإجابة على أسئلة الدراسة والتي اعتمدت على أهداف الدراسة ، حيث تضمن الهدف العام للدراسة:

تقييم إدارة النفايات في مدارس الثانوية الحكومية في مدينة رفح

والتعرف على مستوى الوعي البيئي لدى طلبة الثانوية العامة ومدى ارتباطه باتجاهاتهم ومدى استعدادهم للعمل من أجل البيئة

تفرع عنه الأهداف التالية:

١- تحديد مستوى الوعي البيئي لدى طلبة الثانوية العامة في المدارس الحكومية في مدينة رفح

٢- درجة ارتباط مستوى الوعي البيئي باتجاهاتهم نحو البيئة

٣- مدى الاستعداد من أجل المحافظة على البيئة

٤-أثر الجنس ، الصف والمنطقة على درجة الوعي البيئي

٥-وضع فرضية أن الطالبات أكثر وعيا من الطلاب

بناءً على ما سبق تم إتِباع الخطوات التالية:

قام الباحث بحصر أهم المفاهيم ، التعريفات والاتجاهات البيئية التي ينبغي أن يكون قد اكتسبها طالب الثانوية العامة وذلك ليتسنى إعداد قائمة بها ومن ثم إعداد اختبار قياس مستوى الوعي البيئي وذلك من خلال الاضطلاع على:

- بعض الكتب والمراجع والدراسات السابقة في مجال التوعية و التربية البيئية

- بعض الدراسات السابقة التي تناولت الاتجاهات البيئية

- نتائج بعض المؤتمرات والندوات التي عُقدت حول البيئة والتربية البيئية

في ضوء ذلك تم:

- إعداد اختبار تحصيل في القضايا والمفاهيم البيئية لدى الطلاب والطالبات

- إعداد مقياس الاتجاه نحو البيئة

وبناءً على ما سبق أرجو من سيادتكم التكرم بالاطلاع على المقياس وإبداء الرأي حول دقة صياغة الأسئلة ومناسبة كل سؤال لقياس ما وضع لقياسه

و اقبلوا وافر الاحترام والتقدير

الباحث/ اياد عفانة

الجامعة الاسلامية/ كلية العلوم- صحة البيئة

مرفق لكم طيه: نسخة عن أداة القياس

Annex 5: Questionnaire in Arabic Language

أولا: البيانات الشخصية

الجنس :	ذكر ❐	أنثى ❐	التاريخ :		2015
العمر :	.....				
الفرع :	الفرع الأدبي ❐		الفرع العلمي ❐		
المعدل التراكمي لآخر سنة دراسية :	.....				
اسم المدرسة :	.....				
الوضع الصحي :	سليم ❐		مريض ❐		
إذا كنت مريض فما هو نوع المرض :	.....				
مستوى الأب التعليمي	ابتدائي ❐	اعداى ❐	ثانوي ❐	جامعي ❐	
مستوى الأم التعليمي :	ابتدائي ❐	اعداى ❐	ثانوي ❐	جامعي ❐	
مهنة الأب :	.....				
مهنة الأم :	.....				
دخل الأب الشهري :	.....				
السكن :	مخيم ❐	مدينة ❐	قرية ❐		

ثانيا: الأسئلة ذات الإجابات المتعددة:

الجدول ١. المعرفة

يرجى وضع (X) في الجواب الذي تراه مناسبا لهذه المسألة، علما بأن إجابتك يمكن أن تكون:

(موافق بشدة، موافق، غير متأكد، غير موافق ،غير موافق بشدة)

الرقم	السؤال	موافق بشدة	موافق	غير متأكد	غير موافق	غير موافق بشدة
١.	هل تعرف مبدأ التقليل من النفايات؟					
٢.	هل تعتقد أن السلطات المحلية كالبلديات يجب أن تتخذ الخطوات المناسبة في مجال إدارة النفايات؟					
٣.	هل تعلم شيئا عن الفصل والفرز بين النفايات؟					
٤.	هناك صلة بين النفايات البيئية المدرسية وانتشار الأمراض؟					
٥.	هناك علاقة بين النفايات البيئية المدرسية وأمراض الجهاز التنفسي؟					
٦.	هل تعرف آلية فعالة لإدارة النفايات المدرسية؟					
٧.	هل تعرف مضاعفات إدارة النفايات الغير صحيحة؟					
٨.	هل تعرف كيفية التخلص من النفايات؟					
٩.	هل أنت حريص على معرفة المشاكل البيئية؟					
١٠.	هل تعرف ان هناك قوانين تحمى البيئة من التلوث؟					

الجدول ٢. الممارسة

يرجى وضع (X) في الجواب الذي تراه مناسبا لهذه المسألة، علما بأن إجابتك يمكن أن تكون:

(دائما، احيانا، نادرا، نادرا جدا، غير ذلك)

الرقم	السؤال	دائما	احيانا	نادرا	نادرا جدا	غير ذلك
1.	هل لديك النية للمشاركة في التقليل من النفايات؟					
2.	هل تقوم بفصل النفايات في منزلك؟					
3.	هل تقوم إدارة مدرستك باستخدام النفايات المدرسية كسماد لأشجار المدرسة؟					
4.	هل تقوم برمي النفايات الخاصة بك خارج مدرستك؟					
5.	هل ترى القمامة على جانب الطريق أثناء قدومك إلى المدرسة؟					
6.	هل تقوم إدارة المدرسة باستخدام تدابير وقائية ضد انتشار النفايات والتلوث البيئي؟					
7.	هل تشارك في الأنشطة الطلابية للتخلص من النفايات البيئية في مدرستك؟					
8.	هل تستخدم سلة النفايات الموجودة في القاعة الدراسية في المدرسة للتخلص من القمامة؟					
9.	هل سبق لك أن شاركت في ورش عمل وأنشطة مدرسية حول الصحة المدرسية والنفايات البيئية؟					
10.	هل قمت بكتابة أو إعداد ملصق عن النفايات البيئية في المدارس؟					

الجدول ٣. المواقف

يرجى وضع (X) في الجواب الذي تراه مناسبا لهذه المسألة، علما بأن إجابتك يمكن أن تكون:

(موافق بشدة، موافق، غير متأكد، غير موافق، غير موافق بشدة)

الرقم	السؤال	موافق بشدة	موافق	غير متأكد	غير موافق	غير موافق بشدة
1.	التخلص الغير صحيح من النفايات يشكل خطرا على البيئة.					
2.	إدارة النفايات المدرسية هي من مسؤولية إدارة المدرسة.					
3.	التخلص من النفايات المدرسية من مسؤوليات السلطات المحلية.					
4.	أنا أيضا مسئول عن التخلص من النفايات المدرسية بصورة سليمة.					
5.	هناك مشكلة في إدارة النفايات البيئية في المدرسة.					
6.	الطباشير المستخدمة في المدارس هو احد النفايات وهو سبب رئيسي لتلوث البيئة المدرسية.					
7.	الطباشير المستخدمة في المدارس هو احد أسباب المشاكل الصحية عند الطلاب.					
8.	يجب على وسائل الإعلام ان تضع مشكلة إدارة النفايات البيئية بعين الاعتبار.					
9.	ينبغي أن يكون الطالب على بينة من نتيجة التلوث البيئي بالنفايات المدرسية.					
10.	أعتقد أن هناك علاقة بين النفايات البيئية في المدارس وانتشار الأمراض بين الطلاب.					
١١.	أعتقد أنه يجب أن يكون هناك التزام في القوانين والتشريعات للحد من التلوث بالنفايات البيئية المدرسية.					
١٢.	اعتقد أن النفايات مشكلة بيئية.					

ثالثا: الصحة الشخصية

١- هل سبق وان حصلت معك صعوبة في التنفس			نعم ❒	لا❒
صعوبة التنفس تكون مصحوبة ب:	مخاط أنفى ❒	الم في الصدر ❒	صوت صفير ❒	لا شئ مما ذكر❒
يحدث ضيق النفس بشكل:	مستمر ❒		مفاجئ ❒	
٢- هل سبق وان حصلت معك كحة			نعم ❒	لا❒
هل تتفاقم الكحة أثناء تعرضك لغبار حرق النفايات			نعم ❒	لا❒
هل يصاحب الكحة خروج للبلغم			نعم ❒	لا❒
٣- هل سبق وحدث معك تقيؤ			نعم ❒	لا❒
٤- هل سبق وحدث معك إسهال			نعم ❒	لا❒

Annex 6
Observational checklist

Items	Observed	Not Observed
There is a waste bins inside the classroom.		
The classroom participates in any school recycling programs.		
The school currently recycles any materials as a (food scraps, wood waste, Soda bottles, and books paper).		
The school adopts any steps to help reduce waste materials.		
The school adopts any steps to help reuse waste materials.		
The school adopts any steps to help recycle waste materials.		
All class room furniture clean.		
All class room furniture in a good condition.		
The staff room use disposable cups.		
The staff room use reusable cups.		
The school compost organic waste.		
The school has a rubbish collection service.		
There a bad odors detectable inside the school building.		
There is a waste management problem in the school.		
There a proper labeling of waste bins with cover at classroom.		
There a cough between students.		
There a nose irritations between students.		
There restlessness from school environmental waste between students.		
Students wash their hands before and after eating breakfast.		
There is a constant cleaning in the school cafeteria and supervisors from the administration.		
There is a clean bathrooms facility's		
The facility's bathrooms well ventilated		

In regard the observational checklist the result show that most school had a waste bins inside the classroom with 100%, that most schools had a waste bins inside the classroom furniture clean with average 40%.